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QL

WORLD

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One man's experience with Dennis's
Keyboard

Biorhythms
Plot your inner rhythms

Linear Regression
Doing things with statistics



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VOL. 3 ISSUE 5

Editor

Helen "Back to the Drawing Board" Armstrong

Publisher

Mark Kasprovicz

Advertising Manager

Jim Peskett

Creative Director

John Stanley

Graphic Artist

Stevie Billington

Magazine Services

Linda Miller, Frances Maxwell,
Pauline Wakeling
Val Brandon

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Woodstock,
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Coming Soon

Not quite as much as we would have liked, unfortunately. See **Editor's Notebook** on page 9.

**BARGAIN OF
THE MONTH.**

QL unused with Gold Card & Twin 3 1/2 drives
£200 o.n.o 0993 811181 (Oxon)

QLScene

Ten New Digits for Digital Precision

Your assistance is craved to give the Vachhas a breather.

Digital Precision have been augmented, however slightly for the present time, by the arrival of a daughter, **Michelle**, of very small dimensions. Congratulations to Julie and Freddie.

Due to her early arrival and a minor operation, Michelle is being looked after by Great Ormond Street Hospital in London for the time being. The new arrival and a recent bereavement in the family are occupying Freddie and Julie's thoughts a good deal at the moment, so Freddie asks if DPs customers would kindly send in any technical or trade queries or any complicated orders in **by letter** for the time being, so that he can handle them more easily. Normal orders will be handled by the answering machine as usual.

For any of Digital Precision's customers who are affected by the holdup on boards for the new batch of **Miracle Super Gold Cards**, the batch is expected towards the end of May and so should be on their way by the time you read this.

Progs List Information

PROGS have issued some new **leaflets** on all their programs. The leaflet designs are based on their excellent graphics package LineDesign.

"LineDesign" say Progs "Is a drawing program, but it can also be used by people why are not good at drawing." They also supply 150 clipart examples.

ProForma is a **vector graphics library** for C and Assembler programmers, giving high quality output. ProForma is used by LineDesign, PFlist and PFdata to produce the output. ProForma includes clipping paths, transformation matrixes, true WYSIWIG, grey shades, lines and Bezier curves, and other facilities including bitmapping for older graphics.

PFlist is an **easy-to-use listing generator** for any printer, especially inkjet and laser printers. It can include footers with name and date (not for QL World please!), and always allows space for hole-punching for filing. Listings can be in full page, two columns and/or landscape, and the fonts and font size can be chosen from a selection.

There are now some smaller members in the DataDesign - "probably the most userfriendly database program in the world!" to quote Progs again - family.

PFdata creates **hardcopy from DataDesign** through ProForma, giving a large selection of fonts (including those available in LineDesign and PFlist, for LineDesign users. You see how all PROGS' progs work together). "PFdata is the ideal tool for generating tables", say Progs. Using DataDesign as its source, it can also create labels etc. PFdata also allows you to specify a LineDesign file as a background to the printout, so that output can be mixed with drawings, logos, etc.

The confusingly-named (as others have also remarked) **pfb2pff** is a **collection of programs** to allow you to convert an Adobe Type 1 -pfb files into a ProForma -pff font file, add kerning information, print out the complete fonts. Bryan has more to say about this in Troubleshooter this month.

News on DataDesign API is that the **C interface has now been adjusted** to make it compliant with C68 V4.10 onwards, with a few minor changes.

Among the other leaflets which Progs have produced is a complete DataDesign Engine versions pedigree to date - interesting for reference. When we say complete, we mean including such comments as:

"v3.07 view still allowed you to scroll one too far (oops)".

For more information and price lists please contact **Progs Professional and Graphical Software, Haachtstraat 92, B-3020 Veltem, Belgium. Tel. 010 32 16 48 8952 (from UK to Belgium).**

QL 10 Anniversary in Belgium on 18th June!

Miracle Systems are Sponsoring June's QL Tenth Anniversary show, at the Eurovolleycenter, Beneluxlaan, Vilvoorde, **Brussels** in Belgium.

The Belgian show, organised as usual by Jacques Tasset of Club Sinclair BruQsl, is on Saturday 18th June 1994 from 10am to 17pm. For further news contact Jacques, Aarlenstraat 104, B-1040, Brussels. Tel. 010 32 2 233 1222.

Miracle will be showing the **Super Gold Card** (which has been in short supply well into May, as the demand took everyone by surprise, "even Digital Precision" according to Freddie, and the sophisticated four-layer PCB in the Super Gold Card can't be done as a rush job). It's being reported here and there that Gold Card users are often ordering SGCs for their "first machine" and handing on their Gold Cards to their "second machine". Also expected from the English side are other members of the travellers league of QL suppliers - Tony Firshman, Bill Richardson, and Ron Dunnett of Qubbesoft.

Stuart Honeyball of Miracle alone among the English suppliers made it to **Rhode Island** this year - the rest of them went to the **Quanta** workshop in Surrey on the same day! Well, lower overheads. Stuart reports that the **Miracle in Newport** show was smallish, but saw a lot of money changing hands and a jolly good place to socialise. "Everyone saw it as a highly successful show", he says - not bad considering he wasn't able to take Super Gold Cards with him because of the aforementioned shortage at the time.

Next year **IQLR's** Bob Dyl is hoping to put the Show on in Detroit, which is several hundred miles more central in the USA than Newport, offering lower overheads to American travellers, who come from all over the States.

OPEN CHANNEL

PC Archive?

I understand that there is a **PC version of Archive** in existence. I would be very grateful if this could be confirmed and if so, where it can be obtained. I know of **ArcPlus**, but cannot afford £250. Hopefully Archive for the PC will be a bit more reasonable priced.

Dave Sanderson
Portland
Dorset

There seems to be a sudden revival of interest in advanced Archive, even before Transform released their latest version of ArcPlus. Psion no longer sell or support PC-Four - I got the impression they were out of stock - , and Transform are the only company they are aware of working with PC Archive.

Psion's address for enquiries in the UK is Customer Services, Psion Plc, Alexander House, 85 Frampton St., London NW8 8NQ. In the field likely to be

of interest to QL users now, Psion concentrate almost entirely on their famous Organisers.

Add On Inf

In my last mailing, I asked my customers what sort of add-ons they would like to see for Qdos. The following "hit list" is compiled from over 100 replies (giving about **230 wishes**). I think it should be very interesting to programmers and developers, and I hope to make sure it is published wherever possible:

1. A **word processor** running under the Pointer Environment.

2. **Desktop publishing** under the Pointer Environment, but **integrated**, not as two programs like LineDesign/Text87. Maybe the next job for Progs?

More than one-third of the customers asked for one of the two things above!

3. **Fax software**. It seems that many people have not recognised that Jonathan Hudson has written an excellent Fax software package, called **QFAX**, which is PD and can be obtained from various sources, including my QBox.

4. (Which surprised me most) A **replacement program for Easel**, under the Pointer Environment.

5. An **Archive replacement**. (We have got DataDesign, but this does not seem to be suitable for some of the customers, although I don't know why!)

6. A real **CAD** program. [Electronic or structural, Jochen?]

7. More **colours** (can't be done in software, sorry!).

8. **Pointer communications program** - again, we have a superb PD program which codes everything including ZMODEM. It is called QTPI!

9. **Footnotes in text87** - but not a lot I can do about that!

10. **Fast disk copier** for ALL systems, including Atari and Gold Card.

11. **Backup program**. A very good PD backup program, written by Arvid Børretzen, is called **NorBack** (which can be downloaded from the Qdos Box).

12. **Scanner interface and software**, but NOT a printer's head scanner.

All of the remaining wishes were unique, which again proves that most Qdos users are very individual users. There are all sorts of wishes, ranging from BTX programs (same as Mintel in France), Mac-Emulator, Minix, Disk Doctors, etc. up to specific conversion programs for people who use Qdos and other programs on other systems.

Best regards,

Jochen Merz
Dulsberg
Germany

Deskjet Printer

After your remarks about not informing the readership about things that I knew, I have taken your request for information from **satisfied printer users**. So here goes:

Some time ago I had need to produce a quality thesis for my daughter who was at University. From around the end of 1984 I had been using a Brother HR15 and had been very satisfied with it apart from the noise of the daisy wheel and its slow printing rate.

I wanted to produce the thesis in Times Roman using different font sizes and proportional spacing. This led me into the realms of **Text87** and a **HP DeskJet 500 together with the special DeskJet driver from Software87**. With this setup I have no difficulty in printing the ø in Norwegian names without resorting to translation tables and the like.

I purchased a font cartridge for Times Roman and was then able to print in 8, 10, 12 and 14 point Times Roman with the usual bolds, supers and subs and was all set to go. The result looked very professional and we were all delighted with the presentation.

That was just over three years ago and the DeskJet has continued to work hard for its living. Countless reams of A4 paper have gone through the machine and it has been used to produce a variety of letters, notices etc. **LineDesign** is now used to produce the latest notices and listings.

The DeskJet is a very simple machine to set up and I have created setup files to use it for **Quill**, **The Editor**, and **Perfection**. I can therefore highly recommend it. I have no reason to believe that the modern day updates to the basic deskjet family would be any different.

I have said my machine had gone through many reams of paper without problem. That was until one day towards the end of last year it spat out a cog! I contacted the Customer Services Department of HP on a Friday and asked for the name of local authorised repairers. I was told that they did their own repairs and was asked for the serial number. A phone call later I was told that the machine has a 3-year warranty and my machine was in warranty. I was even more surprised to be told that they could call at my home and collect the machine for repair. A date was made for the following Monday afternoon. Much to my amazement and delight it was delivered back to me on the Thursday afternoon free of charge. That is what I call Service!

In summary the HP DeskJet is a fantastic machine and I have had exceptional service from HP.

I am please to see that SNG has finished with that blasted mouse driver! In his latest offering he seems to be in part duplicating the tasks done my TaskMaster and Qpac2. Both offer simple handling of files and offer also a means of viewing them. Anyway, here is my cheque for another year. Would you please note the change of address and by the way, what happened to the Troubleshooter in the March issue?

A G Kendall
Felden
Herts

Thank you. The Deskjet is popular and not expensive for what it does. Output quality is high, and AG has reinforced the point about foreign characters by decorating the top of his continuation sheet with a string of Øs!

Troubleshooter was having time off owing to pressure of business. Simon will be sad that you don't like his mouse

Open Channel is where you had the opportunity to voice your opinions in Sinclair QL World. At least, it was until the channel had to close. If you have any parting words, we can still be reached at Open Channel, QL World, The Blue Barn, Tew Lane, Wootton, Woodstock OX7 1HA.

driver, but pleased that you have remembered his N.

Ramdisks

An answer to Arthur Nunn's query in Vol. III.1: a ramdisk is a means of storing files in the QL's own memory. It can be used in a similar way to a microdrive, for example, by using `SAVE RAM1 _test` instead of `SAVE MED1 _test`. However, unlike a microdrive, when the QL is switched off (or reset) the ramdisk loses its contents. The advantage of using a ramdisk is speed of operation - you can save/load files to/from a ramdisk much faster than to/from a microdrive or disk drive. However, if you save anything to a ramdisk that you want to keep, always make sure that you copy the files across to a mdv or disk drive before switching off the QL.

As to where you might find a ramdisk, several floppy disk interfaces (such as Trump Card) include a ramdisk which is available as soon as the QL is switched on. Otherwise, there are several in the public domain or even available commercially - these will need to be loaded into the QL when it is first switched on, for example, by `LRESPR mdv1 ramprt`. Only once these latter types have been loaded into the QL can they be used for saving or loading programs.

**Rich Mellor
Walsall**

LX-100 Printer

In Vol. 3.3, you suggested that readers should write regarding recent printer purchases.

In March this year I was looking for a new printer and had noted in various magazines that the Epson LX-100 was advertised at around £100 plus Vat and carriage. When I saw one in an Argos store at £119, I took the plunge.

The fact that it had only a parallel port did not worry me, as I had a parallel port on my disk interface. A visit to a local Tandy store produced the correct connecting cable for £4.95, and the printer worked first time.

I think its output is very good indeed from all four **fonts** (Roman, Sans Serif, Draft and Draft Condensed). The fact that it will use ordinary A4 paper which it loads automatically from a 50-sheet cassette is a real boon.

However, I have encountered one **problem**, namely the old one of the **pound sign**! This is included in the italic character set which is supposedly accessible by changing the default settings or transmitting ESC codes from the computer. Changing the default settings sounds easy. Press the font button and switch on the power and the machine loads paper, and offers a choice of five languages in which to print out the current defaults. From here, its behaviour deteriorates, and any attempt to change these defaults results in the printer doing a full print-out of all the options without giving the poor user any chance to make a choice. The ESC codes which should be the easiest method of obtaining single characters have so far baffled me, but I have hopes of working out the correct code eventually.

This is not something which is essential to my use of the printer, and generally I am well pleased with it. However, the existence of facilities which I cannot use is mildly irritating and I should be grateful if you could be of any help.

**G W Rogers
Hall Lane
Sutton Lane Ends
Macclesfield**

Oh Ser (1 and 2)

The 1950s were somewhat pruder than today. I

recall the shock, discovering as a self-conscious teenager, that while the public face of continental loos could present two doors (ladies and gents, jsut like ours), they often led into a common area of cubicles used by both sexes. Eeek! The QL design team produces a similar deception, that my granny would have referred to as "net curtains and no drawers".

This was brought to mind on discovering that, with SERmouse inputting on SER2, it was also inputting on SER1 at the same time. Two sockets on the outside, ofe Device in the "works"?? (Try inputting to SER2, and watch `COPY SER1,SCR`). Could someone provide some words of wisdom on the subject, please?

It would be nice to have SERmouse and a modem working without plugging and unplugging of leads. The continental loos (in the 1950s) had a concierge to sort out the mix-up of sexes, and to show you to your "seat". Can somebody, I wonder, do the same for the SER device? Any responsibility for the association of ideas remains,

of course, with my parenting.

Above effect seen on QL (JS, D16) /Minerva /GC /Hermes.

**Ivan Hall
Lapford
Devon**

Biros Limited!

We received a polite letter from representatives of Biro Bic Ltd., pointing out that "Biro", as featured in the reply to III.3's letter QED Search, is an active trademark of Biro Bic Ltd., and please not to use the word "biro" with a little b (which in strict grammatical terms, I suppose, doesn't really exist, unless it's Greek) as a general term for ballpoint.

So there you are! As it happens, the Biros I had in mind are, in fact, Bic "Crystal" Mediums in blue, black and (professionally) red, to be exact, of which I have been a devoted user since the early '70s. I'm getting short of blue ones, come to think of it. There are none round here I would stoop to pinch. There is one before me even as I type, but someone's been nibbling it. I think it's one of Jim's.

Editor's notebook

I have been told that QL World must close with this issue.

Heck of a way to celebrate the QL's 10th birthday and our own second year at Arcwind.

But it was not entirely unexpected, and many of us are surprised and delighted that QL World was able to continue as long as it has.

The publisher will be writing to our subscribers. Whether QL World will rear its head again, we don't know but, if it does, it will be in a very different form. We are beyond the reach of normal commercial publishers now. But we shall see.

This will affect my life personally in a number of ways, and not without trauma. But my first thought was "Darn, and we've only got another two months to go on the New User Guide!"

I want to thank everyone, readers, suppliers, all QL people, especially the ones I won't be able to thank personally, and the publishers, for your support over the years.

Goodbye and God bless.

TROUBLESHOOTER

Bryan Davies muses on founts, and a new directory service from BT.

There have been many **founts** created for use on the QL, but too many of them have not been good. Few users will have the patience, or knowledge, to sit down and create their own founts, so any program which offers to make the job easy is welcome. The Belgian software suppliers **Progs** have released a program called "pfb2pff" (how's that for a memorable program name?) which allows Adobe Type 1 founts to be converted for use by their ProForma program. ProForma is used, and supplied, with LineDesign, and also with the lesser-known PFdata and PFlist. If you do not have any of these three programs, you can buy ProForma separately.

What is not explained by Progs in their press release is **what sources** the Adobe founts can be taken from. It is stated that _PFB files can be converted to _PFF (ProForma) files, and this may have been a misprint for .PFB, which is the PC format. Type 1 founts are common, and usually quite good.

We had a session with me demonstrating (somewhat inadequately) Line Design version 2.00B at our local Quanta sub-group meeting in May and everyone seemed very impressed with the general speed of the program and its ability to enlarge text and images without ruining the appearance of them. The performance with the **Gold Card** is very good, and it will no doubt be considerably better with the Super Gold Card. The con-

trast between the jaggedness of the screen presentation and the smoothness of printed output emphasised that the display really is the weak area of the QL system now.

How to Use Cueprint?

On the subject of founts, a reader asked some time ago how to make use of the fount down-loading function in the fount program **CuePrint**. Has anyone used this? In principal, it should be possible to make use of the founts provided with that program, without actually running the program itself. The printer the founts are sent to must have **memory**, to hold the founts, and the Kaga-Taxan KP-810 (and KP-910) had a spare chip socket which would take a chip supplied

What the reader was apparently having trouble with was the method of telling the printer to use particular characters from any fount that had been sent to the printer.

If there are two programs of a type, the automatic tendency is to compare one with the other and say "that is the best", but we really do not need to do that. Take Text87 and Perfection, or Professional Publisher and LineDesign, and you have pairs of programs which aim to do the same job, but which do it in very different ways. For budget reasons, most users choose one or the other but, given the freedom, it would be desirable to have all of them.

The memory now available to us makes it possible to have several major programs loaded at once, each of them available within a second or so, and all running at a sensible speed. My Gold Card system was quite happy to have **Perfection 5.14**, **Text87 Plus-4 version 4**, **LineDesign 2.00B**, **Files 2 (from TaskMaster)** and **FlashBack 2** loaded at the same time, during the Quanta session mentioned above. There were no painful lags in switching between these programs, and all ran normally. The screen did get a little confused at times, though!

Ongoing Puzzles

No information has come to light on a couple of queries. If anyone can shed any light on these problems, it would be welcomed:

1) On the **Thor**, use of the Ctrl, Shift and Alt keys with alphanumeric keys gives erratic results. The main manifestation is a long delay in response to the keypresses. Even worse, having pressed some of the combinations, the effects appear to be felt much later, after the keys have been released. This leads to unpleasant effects, such as text being deleted when least expected!

2) **Fserve** - can this command safely be used in a normal boot file? Or should it be issued from the keyboard subsequent to boot-up? In some notes of mine (dated 1987), there was a comment to the

effect that this command should not be used in a boot, and there was certainly trouble of some sort when it was put into my standard boot, so that it now has REMark in front of it. Can it affect output from the SER ports?

Odds and Ends

Budding SuperBasic programmers might apply to Eurotunnel. One of my recent visitors told me that the developers of the engine-management software for traction units had left the project. It may be no more than a rumour, but those of us who live alongside the rail track would welcome any contribution that would quieten the Eurostar traction units down; they make a remarkable amount of noise to go so slow! One of their noises appears to come from the brakes, which seem to be off at the front of the train but on at the rear - bet the rear end is British!

British Telecom has a facility called **Phone Base**, which is an on-line version of the telephone directories for the UK. If you have addresses and need the 'phone numbers to go with them, this system is worth investigating. There is no charge to join it, but you pay a fixed line charge; the rates when I checked a short time ago were from 2.8 to 10 pence per minute, depending upon the day and time calls are made. You need a modem, and it has to be able to emulate a VT100 terminal and work with the standard "AT" codes. This should present no problem to current modems and software.

The system is fairly easy to use, but has its drawbacks, related to its ancestry. You cannot ask for a 'phone number for someone named Jones anywhere in the country, for example. It is necessary to specify an area, and the largest area the system accepts is a County; there are quite a lot of counties in the UK, making it a lengthy (and costly) business to track down someone "of no fixed abode".

The **modem** I used when checking Phone Base was a Dataflex Pocket Gem, which is about the size of a large matchbox. You can also get modems on PCMCIA cards, little bigger than credit cards. The wonder of the size was considerably tarnished by the nine weeks it took for the modem software to arrive, from the time the device itself was purchased. Be assured that this was not

from a QL supplier, though.

Obscurantism

One prime reason for hardware failing to achieve mass sales is the obscurantism practised by suppliers of certain types of product. Maybe that is the wrong word, but the dictionary describes an obscurant as "an opposer of reform and enlightenment", and that is something like what is needed. The modem field is a wonderful example of how to make a piece of hardware completely useless for the average computer user, simply by making the instructions unintelligible and far too long.

The Phone Base exercise was reminiscent of one long ago, when a set of **Tandata** units for the QL first came my way. All I wanted to do was contact one, simple service, but the instructions were

almost totally irrelevant to that. It was necessary to read through pages and pages to find the odd snippets of information that related to the task in hand. Most potential buyers read or hear about this and forget the whole idea.

Looking for a cheap **24-pin dot matrix printer**? Give a thought to the **Panasonic K-XP2123**. This is a successor to the K-XP1123 and seems a better printer for the same price (£140 plus VAT, including delivery, from Novatech). A tractor feed mechanism is included, printing is reasonably quiet (there is a quiet, slower mode to make it even quieter), and setting-up is just as good - or bad as with most dot matrix printers. The controls on dot matrix printers all seem awful to me, these days, but there are a few thoughtful touches with the 2123 which ease the pain: paper can

be fed in three ways; the tractor feed can be push or pull; there is an extra-cost option to print in seven colours; there is an automatic feed-in sequence for continuous paper; a Tear Off switch allows the paper to be advanced or reversed for tearing sheets off.

INFORMATION

Panasonic K-XP2123
DMP printer, £132 plus £8 delivery plus VAT:

Novatech
Blueprint 1400
Dundas Spur
Portsmouth
Hants. PO3 5RW.

Tel 0705 664144
Fax 0705 664244

QL TENTH ANNIVERSARY

EUROVOLLEYCENTER, BENELUXLAAN, VILVOORDE

BRUSSELS

Sponsored by MIRACLE SYSTEMS

Saturday 18th June 1994 10h00 - 17h00

Come to the international meeting to celebrate the first 10 years of the QL. Don't miss it - there's a mystery gift for all attendees. The new **SUPER GOLD CARD** will be demonstrated and on sale. Miracle Systems, TF Services, W.N. Richardson & Co. and many others will be there.

SuperBasic In Action

Simon N Goodwin extends his SuperBasic file Browser to view graphics.

This is the latest installment of the SuperBasic Browser, an easily extendable utility to simplify and speed up Qdos file operations. The program is based on the file requester developed last year, and add-on routines which appeared in the first part of this project, two issues ago.

As usual I set out to develop a useful program, and illustrate powerful and generally-applicable algorithms on the way. You don't even need to type in all the parts to find these examples useful. Many of the routines in the Browser are likely to

come in handy in other SuperBasic programs.

This month's listings come in three parts. The first is a new version of the code at the start of the file requester, adapted to have two entry-points, NEW_VIEW and SELECTOR. These are called from WINDOZE and LOOK_AT, presented in the last episode.

The first group of lines, from 100 to 700, may look daunting but it is not as complicated as it looks. NEW_VIEW opens the menu and scroll-bar windows, reads and displays the directory. SELECTOR

allows file operations to be performed once a window is ready.

Many of the lines are derived from REQUEST\$, which appeared in QL World Vol. 2 issue 7 last year, and you have a head start if you have already typed that in. Some of the initialisation has been moved out of the function to the start of the program, the call to SHELL_SORT is now optional, and the lines have been renumbered.

A few other changes are required in the File Requester routines. Sorted lists are now optional, so calls to SHELL_SORT should be made conditional, dependent on the value of the 'flag' variable SORTING:

2740 IF sorting : SHELL_SORT

PROCEDURE CHOOSE has been extended to recognise the left and right arrow keys, which swap control to the other file window, and to call ACTION or DO_COMMAND when files are selected:

3100 ACTION com_code%, PRE-FIX\$(path%), dir\$(here%)

3120 =27,200,192 : EXIT poll :

REMARK here%=0 removed

3125 =REMAINDER : DO_COMMAND

New Commands

The second part implements another five Browser commands: EDIT, GRAPHICS, INFO, MOVE and PRINT. MOVE simply calls the subroutines for COPY and DELETE (coming soon) while INFO calls SHOW_INFO, from the last episode of SuperBasic in Action.

PRINT uses the Toolkit 2 SPL command to copy the selected file to the default spool device, usually set with SPL_USE to "SER1", "PRT" or "PAR" depending on your printer. SPL opens the file and copies it 'in the background', leaving your system free for other tasks. If you lack Toolkit 2, and you don't mind waiting for printout to complete, you could use something like:

```
100 REMARK SuperBASIC In Action FILE REQUESTER updates
110 REMARK By Simon N Goodwin for Sinclair QL World
120 REMARK Version 2.0, May/June 1994; Toolkit usage:
130 REMARK ALCHP, ANYOPEN%, CHAN_W%, CURSEN, CURDIS, EDIT$, FPOS, FLEN,
135 REMARK GetHEAD, INPUT$, MORE, MOVE_MEMORY, NEWCHAN%, RECHP, REPORT,
140 REMARK RENAME, SET_POSITION, SET_PRIORITY, SPL, SPL_USE, STRING%,
150 REMARK SUSPEND_TASK, TYPE_IN
160 REMARK Two TURBO compiler optimisation directives follow:
170 IMPLICIT% current, i,j,k,n,d,type, row, pixelLine
180 DATA AREA 40
190 :
200 max_files%=480 :*=MaxFiles" :REMARK Generous for 720K disks
210 name_limit%=36 :REMARK Standard maximum for Qdos directories
220 sorting=1 : picking=1
230 size_x%="0 :*=XcSize" :REMARK 0 or 2 in MODE 8/12; 0 to 2 in MODE 4
240 size_y%="0 :*=YcSize" :REMARK Configurable to 0 or 1 (double height)
250 dir_type%="255 :*=DirFileType" : type_mask%=255 : pick_mask%=256
260 SPL_USE "ser1" :REMARK Target device for PRINT spooling (or PRT1)
270 :
280 WINDOW #0,480,40,24,216 : PAPER #0,0
290 WINDOW 476,216,24,0 : PAPER 0 : INK 7 : BORDER 2,2
300 CLOSE 4 : REMARK or 8 or 12 if sizes permit
310 WINDOZE 2 : STOP
320 :
330 REFERENCE path$,dir$(0,0),flag%(0)
340 DEFINE PROCEDURE NEW_VIEW(status%,edge%,path$,top%,text_lines%,dir$,flag%)
350 REMARK SuperBasic in Action Requester modified for Qdos BROWSER
360 REMARK STATUS% = report window # (2 by 36 characters or more)
370 REMARK EDGE% = X offset, TEXT_LINES% = eponymous window height
380 REMARK MARK% = select default; PATH% = drive/directory
390 REMARK TOP% = first pixel line; opens #MENU% & #SCROLL_BAR%
400 LOCAL margin% :REMARK LOCAL width%,height%,border_colour% etc.
410 CSIZE #status%,size_x%,size_y%
420 char_x%=CHAN_W%*(#status%,38)
430 char_y%=CHAN_W%*(#status%,40)
440 :
450 menu%=NEWCHAN%
460 border%="3 :*=BorderWidth" : border_colour%="50 :*=BorderColour"
470 width%=char_x% * (name_limit%+1) + border% * 4
480 height%=char_y% * text_lines% + border% * 2
490 margin%=edge%-border%*2
500 OPEN #menu%,"SCR_" & width% & "x" & height% & "a" & margin% & "x" & top%
510 :
520 scroll_bar%=NEWCHAN%
530 OPEN #scroll_bar%,"SCR_8x" & height% & "a" & (2+width%+margin%)&"x"&top%
540 PAPER #scroll_bar%,2
550 width%=width% - border% * 4
560 :
570 mark%=0
580 GET_DIR
590 here%=0 : Line%=here%
600 TIDY_MENU
610 IF sorting : SHELL_SORT
620 FILL_WINDOW here%
630 END DEFINE NEW_VIEW
640 :
650 REFERENCE path$,dir$(0,0),flag%(0)
660 DEFINE PROCEDURE SELECTOR(status%,path$,text_lines%,dir$,flag%)
670 REMARK Parameters as above, but fewer; uses MENU% & SCROLL_BAR%
680 CURSEN #status%
690 CHOOSE
700 END DEFINE SELECTOR
```

```

7190 REMARK EDIT command subroutine
7200 (CURDIS #0 :REMARK Allow task to grab keyboard input
7210 EXEC "FLP1_HISOFT" :REMARK For example Hisoft Devpac 2
7220 SUSPEND_TASK 20 : TYPE_IN CHR$(10) & CHR$(255) & "L"
7230 SUSPEND_TASK 20 :REMARK Wait for filename input window
7240 TYPE_IN drive$ & file$ & CHR$(10):REMARK File to load
7250 CURSEN #0
7260 RETURN
7270 :
7280 REMARK GRAPHICS command subroutine
7300 SAVE_SCREEN
7310 ch%=NEWCHAN%
7320 OPEN_IN #ch%,drive$ & file$
7330 MORE_GRAPHICS
7340 CLOSE #ch%
7350 RESTORE_SCREEN
7360 RETURN
7370 :
7380 REMARK Show INFORMATION about file
7400 SHOW INFO drive$ & file$
7410 RETURN
7420 :
7490 REMARK MOVE
7500 GO SUB 7000 :REMARK Copy
7510 GO TO 7100 :REMARK Delete original
7540 :
7590 REMARK PRINT to default SPL device
7600 SPL drive$ & file$ : RETURN
7610 :

```

COPY DRIVES & FILE\$ TO "SER1"

The EDIT command is set up to call HiSoft's Devpac editor, but the code is adaptable for other editing tasks. Devpac does not take a file parameter so Browser uses timed TYPE_IN commands to If you lack SUSPEND_TASK and TYPE_IN (from Turbo Toolkit) you can substitute the standard PAUSE command and use the DIY Toolkit QUEUE% function to simulate keyboard entry.

EDIT starts by temporarily turning off the cursor in channel #0, as we want the new task to grab input when it starts. Then it loaded the editor with an EXEC command, and waits a bit for it to start up and grab control of the keyboard.

Like many Qdos editors, Devpac expects the user to specify its buffer size before editing can commence. TYPE_IN queues an Enter character, CHR\$(10), to accept the default, then types ALT L (CHR\$(255) & "L"), the key-press to load a new file.

Another short delay is needed to give Devpac time to process these signals and swap input to the second window, where file names are entered. The delay time of 20 frames, about 400 milliseconds, is plenty for this Gold Card QL but may need to be extended for a slow or busy machine.

Finally Line 7240 enters the drive and file name for loading. Devpac loads the file, and Browser can continue with its cursor re-enabled in the lower window.

You can do much the same thing with other editors, like QED, EDT, SPY, Metacomco's ED, QD, Arced and The Editor. All you need to do is answer any start-up questions, and replace the ALT L pattern with the key codes to select "LOAD" in your editor.

If you own Toolkit 2 or some other extended version of the EXEC command, it is particularly easy to call the Public Domain QED editor, because it accepts a file name as a task parameter:

```

7210 EX "FLP1_QED_EXE";
drive$ & file

```

This loads the editor and the chosen text file, with no need for subsequent SUSPEND_TASK and TYPE_IN commands.

The graphics file viewer works like DIY Toolkit's MORE command for text, is compatible with Minerva's two screens and can easily be extracted for use in other programs. It consists of two routines: MORE_GRAPHICS reads bytes from #CH% and displays in windows #0 and #1.

GRAPHICS_LINE is used to read each line from the file. If the file has less than one line

left, it is filled with null characters, CHR\$(0), to pad the line with black pixels.

Line 9900 generates a diagonal striped pattern after the end of the file, using a different character-code in the cyclic binary sequence 1, 2, 4, 8, 16, 32, 64, 128, for each line. These are more useful than nulls when you're looking at a file with blank lines at the end, and need to know where the real data stops.

Graphical Browsing

MORE_GRAPHICS lets you scroll back and forth through any file, seeing its contents as Qdos graphics. This is a quick way to establish the internal structure of a file, as it's easy to see the difference between code, data, graphics and text and you get more information on each screen than is possible with numeric or textual displays.

The routine shows the location reached in the file at the bottom of the screen, along with the file size in bytes, and you can move to any offset within the file by pressing Enter and typing in a new offset for the display to start.

You can scroll back and forth a page at a time by pressing Alt-up or Alt-down, just as with the MORE command. The strange characters in line 9520 are the DeskJet's interpretation of Qdos vertical arrow characters; I printed the listing on a JM QL, which lacks the TRA command to translate such characters from Sinclair into HP codes. Line 9550 calls MINIM, a SuperBasic version of the MINIMUM function, to find the least of its two parameters.

The down arrow key scrolls forward a line at a time, so you can smoothly scroll to any line of the image. This is important as many files have more pixel lines than can appear on screen at one time alongside the prompts, file name and position display.

Line 9750 uses MOVE_MEMORY to move the previous display up by one pixel, making room for a new line at the bottom: TOP+LINES-1. Paging and scrolling goes much faster after the file has been read once, because Qdos Slave Blocks largely eliminate the need to re-read the disk.

The height of each graphics page depends on the height of SuperBasic's window #1, read from the Qdos channel definition with the CHAN_W% function from DIY Toolkit Volume C. Alternatively you can emulate this function with calls to PEEK_W and CHBASE (Volume Q). Real hackers can probably get away with direct PEEKs, as long as they steer clear of QRam, QPac, and the Thor windowing system, which change the channel offsets.

The graphics display uses the full width of the QL screen - 256 pixels in Mode8, or 512 in Mode4 - as this ensures that screen images are correctly aligned, even if the left hand edge is invisible on a TV, as is usually the case.

The QL was originally designed to run at a clock speed of 8 MHz, but this was cut to 7.5 MHz at a late stage when Sinclair found that

the ZX-8301 display chip had trouble with the higher speed. The result was that each pixel was output for slightly longer than anticipated, so a whole line was too wide for most TV screens. Monitors usually need less time to 'fly back' to the start of a new line, which is why they can display the full width, even at 7.5 MHz.

MORE_GRAPHICS reads and displays lines of 128 bytes with the INPUT\$ toolkit function. It ignores the width of window #1, so normal screen images are correctly aligned from one line to the next. The default full-screen width is compatible with files saved by EyeQ, GraphiQL, Open World, Painter, QL Paint, QSpec, Quick Mandelbrot, Screen Snatcher and most other Qdos pixel graphics programs, as well as simple SBYTES commands.

A few programs use a different width for pixel lines, so their images appear sheared diagonally across the screen. This affects vintage M-Paint files, which reserve a slice down one side of the screen for icons and patterns, and the FISHCOILS_WIDE image in the Public Domain Escher Graphics disk, which was converted from a US system, preserving its 640-pixel line-width.

If you want to display these files correctly, or use a wider screen on a Qdos Emulator, you should change the value 128 in the program to suit the number of bytes per line in your images, and pad or truncate input lines to fit your chosen window.

Not Just Graphics

MORE_GRAPHICS is useful even if the file does not contain graphics, because it's a quick way to determine the structure inside the file. Empty areas appear as black rectangles, such as the Channel and Vector Table spaces inside Turbo tasks, code appears as a random mush - like the initial QL screen when you turn it on, which consists of rom code - and data usually reveals its organisation by the pattern it forms on screen.

If you view a Quill document as graphics you'll see the Ascii text at the start, followed by columns of paragraph table data. At a glance you can see the proportion of extra information added to keep track of the text formatting. It is even possible to distinguish areas of CAPITALS, blank space, lower case and digits by the pattern on the screen.

Founts can be distinguished, although they are scrambled horizontally as each character definition uses only nine bytes. Look for the script founts embedded in Psion Quill and Xchange, which appear as a band of heiroglyphics in the file.

Text appears as columnar stripes, because bit 7 is clear for seven bit Ascii characters, lower-case letters have bit 6 set, and so on. Groups of characters form distinctive patterns that are much easier to recognise

than they are to describe.

Some program files, like Speculator_code and DJC's Quick Mandelbrot task, have graphic screens imbedded inside them, as soon becomes apparent when you view them with MORE_GRAPHICS. The Psion game Match Point contains a complete Mode4 screen backdrop at offset 37100 in the MATCH2 file.

It is unlikely that such images will start on a 128-byte line boundary, so you will probably need to enter a new start offset to get the image correctly lined up - otherwise it will appear sliced down the screen at the point where one line ends and the next one starts.

Qdos graphics are 'word-aligned' - in other words, it takes

two bytes to describe each group of pixels - so the offset should generally be even, or mono graphics will be 'ghosted', with red and green parts offset by eight pixels. To see this, set an odd offset, like one or three, while viewing a black and white graphics file in Mode4. It's a bit like viewing a 3D film without the coloured glasses.

Loose Ends

You now have the majority of the source code for the SuperBasic Browser, and a handful of procedures and functions which are useful in their own right. The project goes on to routines to copy, insert and delete files and directories.

```

9380 DEFine PROCedure MORE_GRAPHICS
9390 LOCAL aPage,k,k$(10),lines,filelen,row,target,top
9400 REMark Reads graphics from #ch% & sends prompts to #0
9410 REMark Display is full-screen width in #1 vertical area
9420 REMark Assumes 128 byte lines in file & video memory
9430 REMark Uses current screen in Minerva F3/F4 64K mode
9440 top=CHAN_W$(#1,26) : REMark First line of Window
9450 lines=CHAN_W$(#1,30) : REMark window pixel height
9460 fileLen=FLEN(#ch%) : aPage=lines*128 : REMark Bytes/Page
9470 INK #0,4
9480 PRINT #0;"Browser Graphics file viewer - use keys"
9490 IF aPage>=fileLen
9500 PRINT #0;"ENTER, SPACE or ESC to return to the menu"
9510 ELSE
9520 PRINT #0;"_ to move, +ALT for pages, ESC to Exit"
9530 END IF
9540 INK #0,7 : AT #0,2,0 : REMark Backdrop for prompt
9550 PRINT #0;MINIM(aPage,fileLen)," of "!fileLen!"in"!file$;
9560 REPEAT page_view
9570 FOR row=top TO top+lines-1 : GRAPHICS_LINE row
9580 IF aPage>=fileLen : k$=INKEY$(#0,-1) : EXIT page_view
9590 REPEAT fine_view
9600 AT #0,2,0
9610 PRINT #0;FPOS(#ch%)," ";
9620 k=CODE(INKEY$(#0,-1))
9630 SELECT ON k
9640 =27 : EXIT page_view
9650 =10 : AT #0,2,0 : k$=EDIT$(#0,FPOS(#ch%),10)
9660 CURSEN #0 : IF "ee" INSTR k$ : NEXT fine_view
9670 IF k$="" : NEXT fine_view
9680 IF k$<"0" OR k$>fileLen & "" : NEXT fine_view
9690 SET_POSITION #ch%,k$ : EXIT fine_view
9700 =209 : target=FPOS(#ch%)-lines*128*2
9710 IF target<0 : target=0 : REMark Page to top
9720 SET_POSITION #ch%,target : EXIT fine_view
9730 =217,32 : REMark Page down, easy default case
9740 =216 : target=top*128+SCREEN_RAM
9750 MOVE_MEMORY target+128 TO target,(lines-1)*128
9760 GRAPHICS_LINE top+lines-1 : NEXT fine_view
9770 =REMAINDER : SUSPEND_TASK 10 : NEXT fine_view
9780 END SELECT
9790 EXIT fine_view
9800 END REPEAT fine_view
9810 END REPEAT page_view
9820 END DEFine MORE_GRAPHICS
9830 :
9840 DEFine PROCedure GRAPHICS_LINE(pixelLine)
9850 LOCAL left,target
9860 left=fileLen-FPOS(#ch%)
9870 target=SCREEN_RAM+128*pixelLine
9880 SELECT ON left
9890 REMark If the file is exhausted, show a stripey pattern
9900 =0 : POKE$ target,FILL$(CHR$(2^(pixelLine && 7)),128)
9910 =1 TO 127 : REMark One incomplete line remains; pad it
9920 POKE$ target,INPUT$(#ch%,left) & FILL$(CHR$(0),128-left)
9930 =REMAINDER : POKE$ target,INPUT$(#ch%,128) : REMark 1 line
9940 END SELECT
9950 END DEFine GRAPHICS_LINE

```

Since V4.07 of DEA (an intelligent disassembler) was reviewed in QL World April 1992, the program has undergone changes to bring it up to its current impressive standard. If you do not know what an intelligent disassembler does, please refer to the 1992 review for full details.

Simply, DEA attempts to take a finished machine code program and convert it back to the source code in which it was written (assembly language). This is akin to taking a washing machine and producing a blue print of it.

The manual (currently 54 pages laser-printed) has been significantly rewritten and is now much easier to understand, and even has a tutorial for new users. It also has a 'beginner's corner' to point you in the right direction.

Tutorial

The 9-page tutorial gives a step-by-step guide to loading the program and using it to disassemble the whole of the Turbo runtime toolkit (supplied). Users who know their keyboards should be in no doubt as to which key to press at each stage and will probably be amazed at how little effort can produce a full source code - in fact, DEA can

Rich Mellor runs a highly effective upgrade of the Intelligent Disassembler.

parse 99% of the whole file without the user having to touch a key! The tutorial then goes on to show how DEA can be used to extract one (or more) keywords from within the whole Turbo toolkit (or any other toolkit); how to go about disassembling the Gold Card rom; and how to extract a keyword from the QL's rom. I found this part of the manual extremely well written and can only hope that other software houses will pay as much attention to new users.

Most improvements to the main program are in parsing the machine code file (to ascertain which areas of the file are machine code and which are data). DEA now recognises standard Qjump configuration blocks and Thing headers, as well as automatically recognising word and byte length strings, C-type strings, SuperBasic definition tables and general assembler code. In order to reduce the likelihood that DEA will recognise a block of data as the wrong type, DEA 5.20 now has a 'trial parsing mode'.

Parse Levels

Normally, DEA works through a machine code file, disassembling from the start of the file (or a specified start offset), and following any machine code branches, returning to the main code as it goes along, allocating labels as necessary to any parts of the code referred to. Having done this (Level 1 parsing), DEA then searches the file for Qjump configuration blocks (Level 2) and, if found, will try to disassemble its structure (although this is still primitive in my current version). After Level 2 is Level 3, where DEA looks at all labels which have been allocated to the machine code file but not yet decoded. A label could point to a

machine code routine, a block of data, some text or any other data-type supported by Qdos. DEA uses a trial parsing mode, which enables it to follow the flow of data pointed to by the label and decide how it should be classified.

Levels 4 and 5 are used by DEA to look for blocks of machine code which may not be referred to elsewhere, and for any strings embedded in the machine code. If any new labels are created while parsing under these Levels, control is returned to Level 3. Having exhausted these avenues, DEA will look again at any Labels which have not yet been decoded and try to decide if these labels can be safely assumed to be byte data blocks (Level 6).

As a final check, control is then returned to Level 3 so that DEA can have another look at the remaining blocks of code.

It is only when DEA has progressed through this sophisticated multi-level parsing that the user is called on to take any action. This is Level 7, and the user must look at the remaining blocks of code and decide how to classify them. You will not have much to do, as tests showed DEA decoding over 80% of all but the most complex programs by this stage.

Better Level 7

Level 7 parsing has been significantly improved - you are now presented with both the disassembly of the start of the unknown block of code and a hex/Ascii dump of the block. You can then either use the cursor keys to move through the assembly listing, or tab and the cursor keys to move over the dump. You can specify the start and end of data blocks by . plus Space, or simply use Space to identi-

fy the start of some code. Once identified, you are presented with the data-type menu from which to select a code type for the highlighted block. DEA will always try to guess the most appropriate data-type to be used and automatically place the cursor bar there in the menu, so that, often, you need only press Space again to select the type. If you label a block of code as assembler, DEA will again use trial parsing to test the code, and, if no errors occur, resume parsing at Level 3 using that block as its starting point.

DEA now requires even less user intervention when parsing than before, and yet appears to maintain reliability. However, if you prefer a more 'hands on' disassembler, DEA also offers this - you can select the degree of freedom given to DEA in selecting code types, and even use functions from the main parsing menu to disassemble the whole code by hand (if you are a real masochist!). Having used DEA a few times, you will appreciate its high degree of automation, which allows it to work in the background while you do something different (the manual has details of how to ensure that DEA can produce the source code in the background even if the Pointer Environment is linked in, although unfortunately, it is still not possible to allow DEA to parse in the background, as DEA updates the name of the parsing Level).

Source Code

Having parsed the code, you go to the second stage, producing the source code. I understand that DEA (unlike some disassemblers) splits its function into parsing and source code production to improve the final output.

The source code can

be sent to screen, a printer or a file. You can specify whether any code which has not been disassembled should be listed (as Ascii/hex or just hex); if the output code should be compatible with the GST (or QMAC) macro-assembler; the character to prefix remarks in the source code, and many other options to alter the layout of the source code.

A new sub-menu allows you to tell DEA what remarks to include in the source code - DEA will recognise most rom vector and trap calls and include an appropriate remark (the trial parsing helps DEA to decipher these calls), including the name of the routine called, either in Qdos or SMS notation. If you opt to view these calls in 'long form', DEA includes a remark with details of the trap number and value of D0 when the call is made. DEA will even now report calls to the Window Manager if asked.

However, this can be a bit error-prone and is best used only if you know that the program being disassembled accesses the Pointer Environment. Other remarks can be included in the source file to detail accesses to System Variables and SuperBasic variables; the status register and even error keys.

Kind Remarks

The new remarking features improve the output quality from DEA substantially and make it easier to read the assembly code. DEA seems to achieve a high level of accuracy with these remarks, although it seems more accurate when creating the source code a second time (the manual suggests sending the output to a NUL file prior to creating the final source code).

Also, when extracting part of a file, a jump to the next instruction in the source code is now spotted

by DEA which inserts a NOP instruction (this prevents error messages in the Metacomco assembler). The quality of the source code is the best I have seen on a QL disassembler. Although DEA may take time over a whole file, it is much quicker than disassembling by hand. It is more accurate than other disassemblers I have seen (and needs less user intervention), which helps to reduce the overall time and puts this program in a league of its own.

Unselfish

DEA has problems deciphering self-modifying code (but then, so does the most hardened machine code programmer). I would have liked the ability to use Level 7 parsing to specify a block of machine code in the same way as a data block, as this would help the program decipher the most common type of self-modifying code more easily

(where the program copies different sections of code onto itself).

DEA has certainly come a long way, and provides all the utilities any machine code programmer (or budding hacker) could ask for. This richness may be the one draw-back - the new user may be phased by the number of options on each menu! Although the tutorial in the manual helps, I would have preferred to be able to switch between short-form menus with only the basic options, and full menus. From experience, Ergon are willing to listen to suggestions and implement them where they can.

INFORMATION

Program: DEA Plus 3 V5.20. Needs min 384K.

Supplier: Ergon Development, Davide Santachiara, Via Emilio De Marchi, 2 42100 Reggio Emilia, Italy.

Price: £28 (3.5in disk) payable to D. Santachiara.

CLUB ACCESS

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Sinclair QL User Club eV. Contact: Franz Herrmann, Talstrasse 21, d-W5460 Ochenfels, West Germany. Magazine: Quasar.

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QL Athens Club. Contact: Stathis Grigoriadis, Tarsu 6-8, 10440 Athens, Greece.

HOLLAND

Sin_QL_Air. Marco Holmer, J

P Coenstraat, 3531 EN Utrecht, Netherlands. Magazine: Quasar. Editor: Same as Secretary. (Chairman: Cor Biemans, Elzenstraat 5, 5461 CL Veghel, Netherlands.

ITALY

Qitaly Club. Roberto Orlandi, Via Brescia 26, 25039 Traveglianto (BS), Italy. Tel. +39 30 6863311. Magazine: Qitaly Magazine. Editor: Dr Eros Forenzi, Via Valeriana 44, 23010 Berbenno (SO), Italy. Tel. +39 342 590450.

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Norwegian AllSinclair Association (NASA). Contact: P Monstad, NASA, N-5580 Oelen, Norway. Magazine: Sinclair Magazine.

SCOTLAND

Scottish QL Users Group. Alan Pemberton, 65 Linger wood Rd, Newtongrange, Midlothian EH22 4QQ. **SPAIN Qliper.** Editor: Salvador Merino, Ctra C_diz,

Cer_micas Mary, 29640 Torrealblanca del Sol, Spain. Magazine: Qliper.

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Svenska QL-Gruppen. Contact: Johan Boman, Toftaasgatan 73, 42147 Vastra Frolunda, Sweden. Magazine: QL-Bladet.

Jamten-TCL (International QL echomail conferences) BBS +46-63-133330. Michael Cronsten, Radhusgatan 61E, 83137 Ostersund, Sweden.

TURKEY

QL Club. Contact: Bulent Artuz, Prof. Sitesi B/1 D/5, Etiler 80600, Istanbul, Turkey.

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QL User Group (West Midlands): Mike Bedford-White, 16 Westfield Road, Acocks Green, Birmingham.

QL MUG (Merseyside): G Reynolds 051 932 1484, evenings. Meet fortnightly.

Solent sub-group: Graham Evans, 32 Reeves Way, Lowford, Bursledon, Southampton. 0703 403350.

South-West sub-group: Allan Hurford, 100 Topsham Rd., St Leonards, Exeter.

USA

NESQLUG and newsletter. Peter Hale, 195 Central Ave., Chelsea, MA 02150, USA

New SJPD Catalogue

Steve Johnson of SJPD has issued a new printed catalogue of **PD software**, and a separate list of **second-user items** including hardware - QL and other computers and QL software (including a small amount of mdv software, although most of Steve's stuff is on disk), books (including out-of-print ones) and magazines. He also occasionally has some new stuff as good prices, and will often take offers.

The PC and Shareware catalogue now has 94 disks of software - The catalogue makes it clear what is on each - a number of texts of classic books on disk (so you can edit your own version of Don Quixote if you like!), several disks of non-English-language software, and some PC-compatible emulators. The catalogue is available on disk, free in return for a QL-formatted disk and sufficient return postage/IRCs (4 x first class stamps in UK). Or contact Steve at 36 Eldwick St., Burnley, Lancs BB10 3DZ, England. Tel. 0282 451854.

QL Press

Quasar 36 (March) is out with Power Saving mit dem QL, QL Barograph, Forth (pages and pages of it), Toolkit 2 pokes, C-Programmierung and other things. All in German, from the Sinclair QL User Club eV from **Peta Jager, Quasar Redaktion, Heisterbegallee 1, 30455 Hannover, Germany.**

QReview Vol 1 issue 3 has a considerable number of games reviews, and articles on QMaths 1, a simple Yes/No response function, DB Progs (a program from American author Bill Cable, available from Dilwyn Jones), Image Processor 2 from DJC, and a shortie on Cueshell from Albin Hessler. £2.00 from **Bruce Nicholls (Quo Vadis Design), 57 Shaftesbury Road, Romford, Essex RM1 2QJ.**

IQLR March-April 1994 has articles on the Editor SE (part 3), QIndex, exchanging QL Abacus with MS-DOS Lotus, Accessing Printer Dat (from Dilwyn Jones), Going OnLine with your QL (very informative for beginners), and QBox USA BBS, among other things. Mainly American contributors, but wide-ranging and news and ads. from all over. USA: **Bob Dyl, IQLR, 15 Kilburn Court, Newport RI 02840, USA. Tel. 0101 401 849 3805 (from UK).** UK contact: **Geraint Jones, IQLR, 23 Ben Culey Drive, Thetford, Norfolk IP24 1QJ, UK.**

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The old phone number will continue in use for the time being, but will only be manned by the answering machine.

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HARDWARE

CL Systems 081 459 1351

Real Time Digitizer

Computer Technik

(Jurgen Falkenburg) 010

49 7231 81058 (Germany)

Hard disk interface and systems, tower housings.

Dilwyn Jones Computing

(DJC) 0248 354023

Process controller, power regulator, network prover.

Miracle Systems 0904

423986. Gold Card; QXL

PC card; disk adapter;

Centron-ics adapter/lead.

Qubbesoft PD 0376

347852

Miracle Trump Card,

Expanderam, 3.5in disk drives. Sales and support.

W N Richardson (EEC)

0494 871319. QL systems, monitors, keyboards and interfaces, disk drives and printers, peripherals.

TF Services 0344 890986

Hermes IPC, Minerva rom, keyboard membrane, repairs, spares.

SERVICES

Adman Services (Dennis Briggs) 0952 255895

Spares, repairs, support.

Joe Atkinson 36

Ranelagh Rd., London W5 5RJ. Roms, mdvs, spares.

Quanta: General Secretary

John Mason 0425 275894

User Group, support, library.

Quo Vadis 0708 755759

QReview.

SOFTWARE

COWO Electronic 010 41

45 211478 (Switzerland)

QTop, Atari QL emulator,

Thor support

Deltasoft 7 Tyrell Way,

Stoke Gifford, Bristol.

Flightdeck, Image D, AMD

Airplan

Digital Precision 081

527 5493. Perfection, PC

Conqueror, Lightning, Pro Publisher and others.

DJW Software 0256

881701 Homebanker

Dilwyn Jones Computing

(DJC) 0248 354023

Discover, Textidy, QL-PC

Fileserver, Fleet Tactical

Command, QLib, File-

master, DataDesign,

QPAC2 and other Pointer

Environment programs.

Di-Ren 081 291 3751

Fleet Tactical Command

(Dist. by Dilwyn Jones)

Ergon Developments

(Davide Santachiara) 010

39 522 70409 (Italy) ZX

Spectrum emulator, Open

World, others.

Jochen Merz Software

010 49 203501274

(Germany) QL/Atari emula-

tors, QSpread, File Finder,

Qptr Toolkit and other PE,

QDesign 2, Qdos refer-

ence manual. German ver-

sions of Qpac 1&2, Qmon and text 87.

Lear Data Systems

6 Southview Green,

Bentley, Ipswich, Suffolk

IP9 2DR. PCB-CAD

Liberation Software 081

546 7795 QLib Basic com-

piler (Dist. Dilwyn Jones.)

Ocean Comp. Services

061 740 9002 Professional

Poolster.

Pointer Products 0258

455117 PE programs

Progs (Van Auwera) 010

32 16 48 8952 (Belgium)

LineDesign, DataDesign,

others. (Dist. by Dilwyn Jones; LineDesign dist. by Software87)

Qubbesoft PD 0376

347852 QL Home Finance, PDomain software.

SJPD Software 0282

51854 PDomain software

Software 87 33 Savernake

Road, London NW3 2JU.

Text87 Plus4, Publishers'

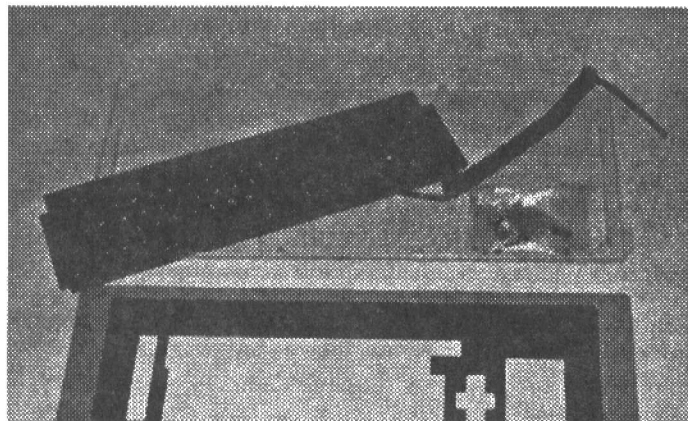
Pack.

Dennis's Keyboards

Len Johnson bought a replacement keyboard and is very happy with it.

When Dennis Briggs advertised a new remote keyboard as a kit in Quanta for only £20 I jumped at the chance. As it was previously advertised at nearly £50 complete, I thought the

When the keyboard arrived I was surprised how simple the whole thing was. Just a few soldered connections and a few bolts and nuts and that was it. And thirty quid cheaper than the fully assembled version!



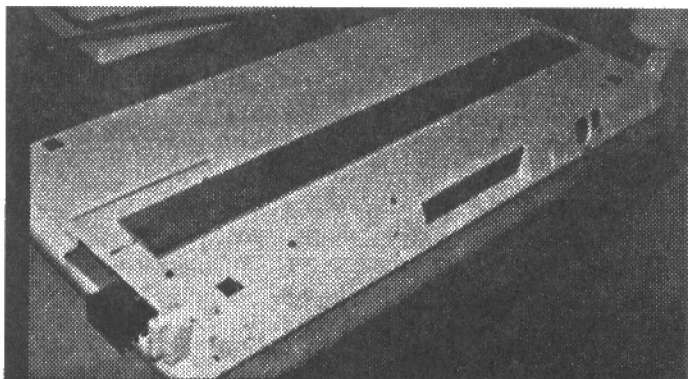
Not too many components to handle!

saving would be well worth a few hours spent assembling the thing.

I was heartily sick of the difficult typing position my existing keyboard forced on me and besides, the space key was beginning to act up. I had my cheque in the post that night!

Gold Card Too

Dennis suggested in the instructions that the QL motherboard and Gold Card might fit into the new keyboard case easily enough and suggested fitting a small fan to keep it all cool in this case. The



The long strip of aluminium heatsink under the new case.

idea seemed quite feasible when I measured everything, and it would be one box less on my desk. I decided to have a go! In the event it proved as simple in practice as it was in theory and no electronic knowledge was needed. It soon became clear to me that the need for a fan could be worked around, and in fact my QL runs cooler now without the fan than it did in the original casing. The only snag is that in this configuration the microdrives have to be irrevocably removed. But who uses the things these days? The QL has come a long way in ten years!

First set the keyboard parts out in a tidy manner and identify the half dozen or so components (Pic A). Next read the instructions! Carefully! Note particularly that one connector strip is reversed! A quick glance at the picture in the instructions and the QL keyboard connectors on the motherboard will show what I mean. Don't worry, if you get it wrong nothing really bad will happen. You will lose a few keys when you try the keyboard and when the fault is put right everything will work as normal.

The curly lead supplied can be used, but when the case is closed I found things a little tight. With hindsight I would use a foot or so of flat disk drive type connector wire from Tandy's. This would fold more easily when the lid is screwed down.

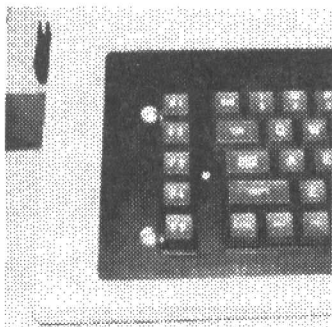
Heat Sink

You will need to buy a piece of 50x3 mm (2in by one eighth) aluminium or stainless steel strip the length of the QL to act as a heatsink (Pic B). Most aluminium fabricators or sign makers will simply give you a piece if you ask nicely.

Once the keyboard wiring has been done according to the instructions, an hour or so with a small soldering iron, the QL can be dismantled.

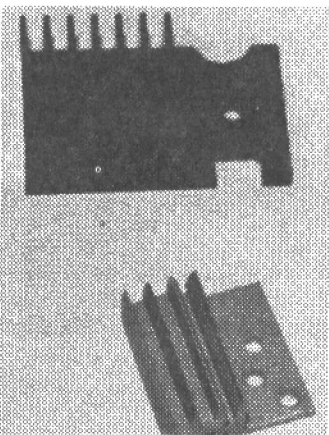
Remove all the screws from underneath the black beast and the top keyboard will lift off. Carefully ease the keyboard connector strips from the motherboard and set the keyboard to one side for now. At this point carefully note how the connectors carrying the keyboard connecting strips are fitted in the sockets on the motherboard. The six wires going to the leds (the little warning lights on the keyboard) for power and microdrives can now be eased up from the socket. The top of the socket slides upwards a fraction to release the wires from the connector. It is best to use a pair of tweezers for this as there are a couple of blue capacitors close to the connector block and you won't get your fingers close enough. Alternatively, simply cut the wires as close as possible to the block with a pair of nail clippers and put a piece of tape over the raw ends to prevent a short circuit. If you do cut them make sure nothing can touch the bare wire ends, and that they are too short to bend and touch each other when the lid goes on!

Remove two of the leds complete with a length of wire from the QL's keyboard and put them to one side. You will need one for the new keyboard as a power-on light. Use the other if you have fitted the Caps Lock indicator and



Indicator LED if the Quanta capslock is fitted.

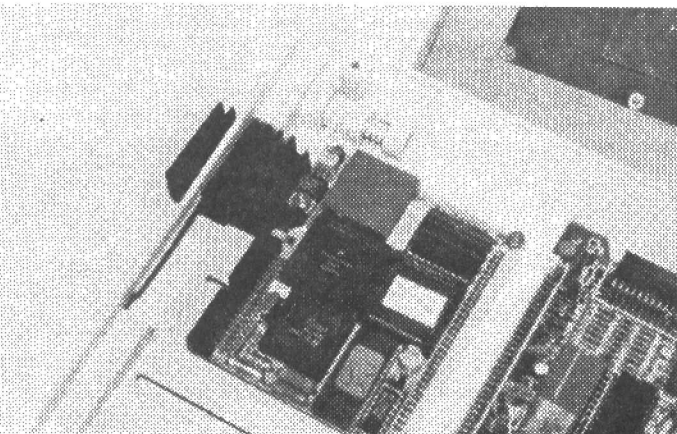
Quanta software. I have this Caps Indicator fitted (Pic C) and it only took a few minutes to do. The



Compare the size of the cut-down heatsink with the Gold Card heatsink.

only problem is that it involves soldering a few wires directly to one of the chips and you must know what you are doing. Nevertheless, it is well worth doing if you type like me! No more screaming when I look up and find the

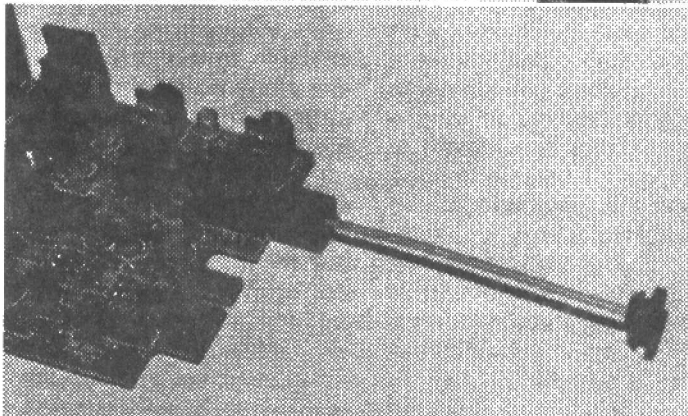
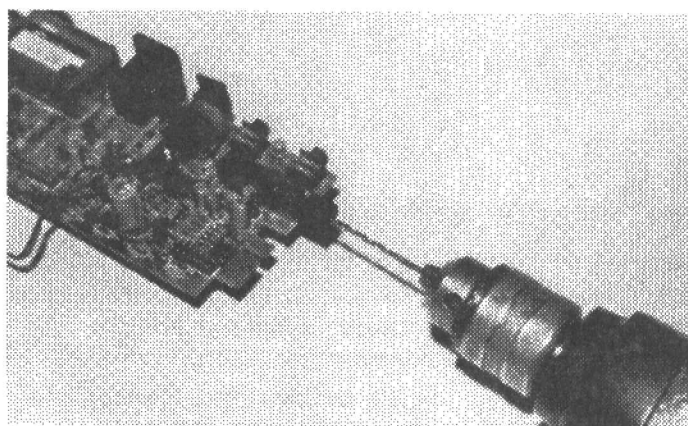
Gold Card in place beside the heatsink and disk cable slots. The GC is secured by bolts through the ends of the main connector.



last paragraph all in capitals. Quanta will supply the simple circuit if you decide to fit it.

Exeunt MDVs!

Now remove the screws holding the microdrives in place and lift the motor assemblies out of the case. The two black wiring strips connecting them to the motherboard ease out of the plug-in connectors at the motherboard end and the microdrives can then be lifted clear and dumped. (I enjoyed that bit!) Note the connector on the motherboard does not raise to release the wires like the led connector; on this one the wires simply ease out under finger pressure. Next remove the bolt holding the black finned heatsink at the right hand side of the QL and push the three pronged 5-volt object the bolt was holding out of the way for the time being. Cut the heatsink in two as shown, leaving the bolt hole intact in one of the pieces. Remove the heatsink from the Gold Card and fit the larger piece of the black QL one in its place with a piece of double sided tape, but do not put the bolts in yet. (The bolt going through the heatsink will go right through the keyboard case and hold the Gold Card in position when the mother-



Drill a hole in the Reset button and extend with spoke wire or similar - the new end is a grommet.

board is finally fitted in the new keyboard case.) The reason for fitting the larger heatsink (Pic D) is to let it project from the side of the keyboard half an inch or so. The original Gold Card heatsink is too short for this. Maybe this is overkill but my setup really does run comparatively cool now. The Trump card is longer than the Gold Card and will probably project enough to cool itself without any modification but I have not actually tried this.

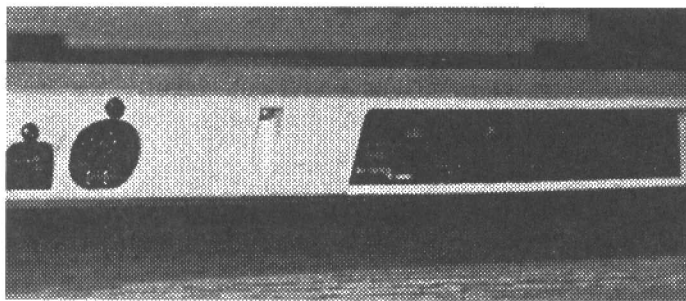
Mark the positions of the holes in the case needed for the monitor, power plugs and the leds. Set the Gold Card or Trump Card up against the case on the left hand side and run a pencil round the heatsink and disk drive plugs (Pic H). I cut the holes through the case by drilling a series of one eighth holes and then joining them up with a piece of junior hacksaw blade. A piece of sandpaper rolled up into a tube puts a nice finish on the holes. Try to make a neat

job of the hole for the power led light as this can be seen from the top of the keyboard. When the holes are cut, slide the motherboard and Gold Card into position so that the various plugs line up with the holes in the case.

Now you can mark the position of the last hole needed in the case. The original heatsink had a voltage control device bolted to it. The wires connecting this device need to be lengthened by about 4in. The transistor simply unplugs at one end, but the other end needs to be cut. Please make sure all new wiring is well insulated and nothing can short out. Lastly, the device needs a hole through the case to bolt it to the length of aluminium heat sink you bought.

Reset Extension

One more hole is needed. The original reset switch needs to be brought out through the case. You



The QL motherboard sockets - holes cut, and the sockets secured with screws from outside.

could unsolder it and fit it or a replacement in the new case but there is an easier way - drill the reset switch with a one sixteenth hole in the end to take a cycle spoke or a length of stiff wire. I used a knitting needle Supaglued into the end of the switch to lengthen it. A small grommet Supaglued on the end of the knitting needle forms a neat finish and works well (Pics J and K).

When the hole is cut for the heatsink fix the aluminium strip under the keyboard with double-sided carpet tape and bolt the

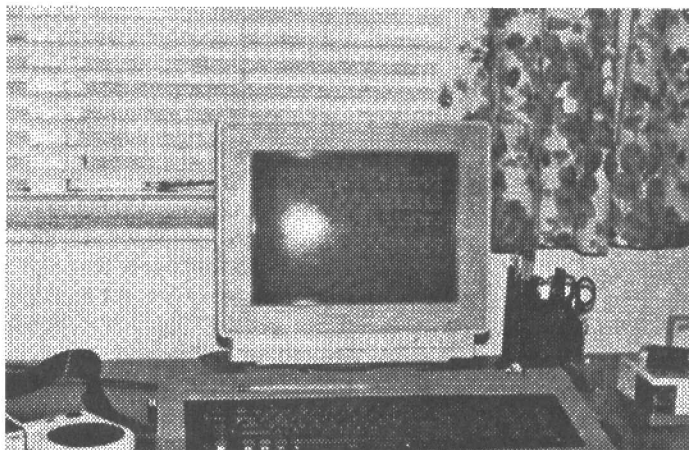
motherboard and Gold Card into the case with bolts through the various existing holes (Pic M). I used plastic dress snaps as insulating washers for this job!

It's a good idea to strengthen the sockets on the motherboard against the thrust of the various connectors as they are inserted. I used a few long self-tapper screws through the keyboard case and through the top of the sockets on the motherboard (Pic M). These screws steady things up nicely. Don't omit them.

Make sure its connecting wires are taped to the edge of the case, and pop the red led you removed from the old keyboard into the hole in the top right hand corner of the new keyboard and secure with a dab of glue and that's about it! Put the wires back into the connector on the motherboard. You did note the way they were fitted originally didn't you?

Close the top of the case with a couple of screws and switch on. When you try the keys you might find some are not working. The cause will be the connector strips. You will probably need to reposition one or the other slightly to the left or right to line the fiberglass connector strips with the strips in the connector block. And that's it!

The QL should have looked like this 10 years ago!!



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Biorhythm Calculator

Neil Gordon simply checks out body-rhythms.

While not entirely certain of the practical effects of the theory of 'Biorhythms', I wrote the accompanying program as a simple biorhythm calculator to try it out. Perhaps a short description of biorhythms is in order for those who have

missed out on these "guides to the body's natural cycle".

Biorhythms are a name given to the apparent cycles that certain aspects of our bodies follow. It has been found that most people's bodies follow certain rhythms, approximating to sine

waves of various periodicity. These rhythms start the moment we are born, and continue regularly from then on.

Good days

Biorhythms are taken seriously by many people, and it is said that they are

widely used, by everyone from football coaches checking on likely player performance, to airlines wanting to check on pilot-safety (in particular watching out for zero days - see below).

Aspects of our body-rhythms are divided into three types for this study:

```
100 REMark "Neil Gordon"
110 REMark "DEFAULT DATE DATA"
120 REMark "CHANGE TO OWN DATES"
130 DATA 1968,12,20,1987,1,1
140 Init_screen
150 Init_data
160 update
170 REPEAT mloop
180 Z=0
190 input_data
200 update
210 totalise
220 set_axes
230 FOR sfor=1 TO 3
240   pos(sfor)=total MOD length(sfor)
250   INK #3,(sfor-1)*3+1
260   draw_graph pos(sfor),length(sfor)
270 END FOR sfor
280 analyse
290 AT #4,0,28:CLS #4;3
300 PRINT #4;"RUN AGAIN(R) OR QUIT(Q)"
310 REPEAT cloop
320   ch$=INKEY$(1)
330   IF ch$="q" THEN
```

```
340     CLOSE #3:CLOSE #4
350     CLS #2:CLS #1:CLS #0:NEW
360   END IF
370   IF ch$="r" THEN EXIT cloop
380 END REPEAT cloop
390 CLS #4
400 END REPEAT mloop
410 DEFINE PROCEDURE init_screen
420   MODE 4
430   OPEN #3,scr_512x256a0x0
440   PAPER #3,0:CLS #3
450   INK #3,7:CSIZE #3,2,1
460   AT #3,0,16:PRINT #3,"BIORHYTHMS"
470   WINDOW #3,482,122,15,16
480   PAPER #3,2:CLS #3
490   INK #3,7:BORDER #3,1,4
500   OPEN #4,con_482x114a15x142
510   PAPER #4,4:INK #4,0
520   CLS #4:BORDER #4,1,7
530   SCALE #3,134,-45,-72
540 END DEFINE
550 DEFINE PROCEDURE init_data
560   DIM pos(3),prompt$(6,25),length(3),days(12),dd(6)
570   RESTORE 610
580   FOR i=1 TO 6:READ prompt$(i)
```



```

590 FOR i=1 TO 3:READ length(i)
600 FOR i=1 TO 12:READ days(i)
610 DATA "Year of birth? (ie.,"Month of birth? (ie."
620 DATA "Day of birth? (ie.,"Present year? (ie."
630 DATA "Present month? (ie.,"Present day? (ie."
640 DATA 28,23,33,31,28,31,30,31,30,31,31,30,31,30,31
650 RESTORE 130
660 FOR i=1 TO 6:READ dd(i)
670 END DEFine
680 DEFine PROCedure totalise
690 LOCAL age,nly,ted
700 IF dd(5)>dd(2) OR (dd(5)=dd(2) AND dd(6)>dd(3)) THEN
710   age=dd(4)-dd(1)
720 ELSE age=dd(4)-dd(1)-1
730 END IF
740 nly=(dd(4) DIV 4)-(dd(1) DIV 4)
750 IF (dd(4) MOD 4)=0 AND dd(5)<3 THEN nly=nly-1
760 IF (dd(1) MOD 4)=0 AND dd(2)<3 THEN nly=nly+1
770 IF dd(2)=dd(5) AND dd(6)=dd(3) THEN
780   ted=0
790 ELSE
800   IF dd(5)=dd(2) AND dd(6)>dd(3) THEN
810     ted=dd(6)-dd(3)
820   ELSE
830     ted=(days(dd(2))-dd(3))+dd(6)
840     m=dd(2)
850     REPEAT 1
860       m=m+1
870       IF m>12 THEN m=1
880       IF dd(5)=m THEN EXIT 1
890       ted=ted+days(m)
900     END REPEAT 1
910   END IF
920 END IF
930 total=(age*365)+ted+nly
940 END DEFine
950 DEFine PROCedure draw_graph(position,length)
960 x=0:ox=0
970 oy=50*SIN(2*PI/length*position)
980 FOR p=position TO position+33 STEP .5
990   y=50*SIN(2*PI/length*p)
1000  LINE #3,ox,oy TO x,y
1010  ox=x:oy=y:x=x+.9*5
1020 END FOR p
1030 END DEFine
1040 DEFine PROCedure input_data
1050 AT #4,0,6:CLS #4,3
1060 PRINT #4,"(Press ENTER for default/previous value.)"
1070 FOR i=1 TO 6
1080   AT #4,1,0:CLS #4,3
1090   PRINT #4,prompt$(i);dd(i);" ";
1100   INPUT #4;l$
1110   IF l$="" THEN l$=dd(i)
1120   IF number(l$)=0 THEN GO TO 1080
1130   IF l$<1 THEN GO TO 1080

```

```

1140 SELECT ON i
1150   =1
1160     dd(1)=l$
1170     =2
1180     IF l$>12 THEN GO TO 1080
1190     dd(2)=l$
1200     =3
1210     IF l$>days(dd(2)) THEN GO TO 1080
1220     dd(3)=l$
1230     =4
1240     IF l$<dd(1) THEN GO TO 1080
1250     dd(4)=l$
1260     =5
1270     IF l$>12 OR (dd(4)=dd(1) AND l$<dd(2)) THEN GO TO 1080
1280     dd(5)=l$
1290     =6
1300     IF dd(4) MOD 4=0 AND dd(5)=2 AND l$=29 THEN GO TO 1080
1310     IF l$>days(dd(5)) THEN GO TO 1080
1320     IF dd(4)=dd(1) AND dd(5)=dd(2) AND l$<dd(3) THEN GO TO 1080
1330     dd(6)=l$
1340 END SELECT
1350 END FOR i
1360 CLS #4
1370 END DEFine
1380 DEFine FuNction number(x$)
1390 FOR scan=1 TO LEN(x$)
1400   IF x$(scan) INSTR "0123456789"=0 THEN RETURN 0
1410 END FOR scan
1420 RETURN 1
1430 END DEFine
1440 DEFine PROCedure set_axes
1450 CLS #3
1460 CSIZE #3,0,0
1470 LINE #3,0,-50 TO 0,50
1480 LINE #3,0,0 TO 298,0
1490 LINE #3,298,-50 TO 298,50
1500 AT #3,2,2:PRINT #3,"+VE"
1510 AT #3,8,2:PRINT #3,"-VE"
1520 AT #3,5,2:PRINT #3,"ZERO" LINE#
1530 AT #3,11,6:PRINT #3,"(TODAY)"
1540 FOR i=0 TO 11
1550   AT #3,10,(i*5.4+9)
1560   PRINT #3,i*3
1570 END FOR i
1580 AT #3,11,20
1590 PRINT #3,"Number of days from present day"
1600 INK #3,0
1610 LINE #3,309,43 TO 337,43
1620 AT #3,2,70:PRINT #3,"EMOTIONAL"
1630 INK #3,4
1640 LINE #3,309,10 TO 337,10
1650 AT #3,5,70:PRINT #3,"PHYSICAL"
1660 INK #3,7
1670 LINE #3,309,-25 TO 337,-25
1680 AT #3,8,70:PRINT #3,"MENTAL"
1690 END DEFine
1700 DEFine PROCedure analyse
1710 AT #4,3,0
1720 PRINT #4,"CYCLE NO. OF DAYS STATE OF COMMENT (FOR TODAY)"
1730 PRINT #4,"THRO' CYCLE CYCLE"
1740 PRINT #4,"EMOTIONAL\"PHYSICAL\"MENTAL"
1750 FOR i=1 TO 3
1760   AT #4,1+4.14-LEN(pos(i))
1770   PRINT #4,pos(i);"/";length(i)
1780   AT #4,1+4.22

```

```

1790 state
1800 END FOR I
1810 IF Z>0 THEN
1820 AT #4,1,2
1830 PRINT #4;"***WARNING*** ";

1840 SELECT ON Z
1850 =1:PRINT #4;"ZERO DAY .BE EXTRA CAREFUL ACCIDENTS ARE LIKELY";
1860 =2:PRINT #4;"DOUBLE ZERO DAY. BE VERY CAREFUL AND STAY ALERT";
1870 =3:PRINT #4;"TRIPLE ZERO DAY,UNUSUAL SO BE EXTREMELY CAREFUL";
1880 END SELECT
1890 PRINT #4;" ***WARNING***"
1900 END IF
1910 AT #4,8,10
1920 PRINT #4;"[THE GRAPH CAN BE USED TO PREDICT ";
1930 PRINT #4;"YOUR CONDITION OVER A PERIOD"
1940 AT #4,9,10
1950 PRINT #4;"OF TIME.THE SHAPE OF THE GRAPH CORRESPONDS ";
1960 PRINT #4;"TO YOUR BIORHYTHMS"
1970 AT #4,10,10
1980 PRINT #4;"THUS YOU WILL FEEL YOUR BEST ";
1990 PRINT #4;"AT A PEAK(AND VICE VERSA)etc.];"
2000 INK #4,7
2010 LINE #4,0,55.5 TO 320,55.5
2020 LINE #4,0,73 TO 320,73
2030 LINE #4,0,28 TO 320,28
2040 LINE #4,38,28 TO 38,73
2050 LINE #4,87,28 TO 87,73
2060 LINE #4,121,28 TO 121,73
2070 INK #4,0

2080 END DEFINE
2090 DEFINE PROCEDURE state
2100 IF pos(i)=0 THEN zero:RETURN
2110 IF pos(i)<=(length(i)+2)/2 AND pos(i)>=length(i)/2 THEN
2120 zero:RETURN
2130 END IF
2140 IF pos(i)>length(i)/2 THEN down
2150 IF pos(i)<length(i)/2 THEN up
2160 END DEFINE
2170 DEFINE PROCEDURE update
2180 AT #4,2,10:CLS #4,3:PRINT #4;"DATE OF BIRTH = ";
2190 FOR I=3 TO 2 STEP -1
2200 PRINT #4:FILL$(" ",2-LEN(dd(i)));dd(i);";";
2210 END FOR I
2220 PRINT #4:FILL$(" ",4-LEN(dd(1)));dd(1)
2230 AT #4,2,40
2240 PRINT #4;"PRESENT DATE = ";
2250 FOR I=6 TO 5 STEP -1
2260 PRINT #4:FILL$(" ",2-LEN(dd(i)));dd(i);";";
2270 END FOR I
2280 PRINT #4:FILL$(" ",4-LEN(dd(4)));dd(4)
2290 INK #4,7
2300 LINE #4,38,74.5 TO 150,74.5 TO 150,82 TO 38,82 TO 38,74.5
2310 LINE #4,158,74.5 TO 266,74.5 TO 266,82 TO 158,82 TO 158,74.5
2320 INK #4,0
2330 END DEFINE
2340 DEFINE PROCEDURE zero
2350 PRINT #4;"ZERO DAY WATCH OUT TODAY,YOUR BODY IS OFF BALANCE."
2360 Z=Z+1
2370 END DEFINE
2380 DEFINE PROCEDURE down
2390 PRINT #4;" DOWN ";
2400 IF length(i)=33 THEN
2410 PRINT #4;"You may have trouble learning and concentrating."

```

```

2420 END IF
2430 IF length(i)=23 THEN
2440 PRINT #4;"You may be tired and have slow reactions today."
2450 END IF
2460 IF length(i)=28 THEN
2470 PRINT #4;"You may feel depressed or more 'serious' today."
2480 END IF
2490 END DEFINE
2500 DEFINE PROCEDURE up
2510 PRINT #4;" UP ";
2520 IF length(i)=33 THEN
2530 PRINT #4;"You should feel bright and alert today."
2540 END IF
2550 IF length(i)=23 THEN
2560 PRINT #4;"You should feel strong and energetic today."
2570 END IF
2580 IF length(i)=28 THEN
2590 PRINT #4;"You should feel cheerful and peppy today."
2600 END IF
2610 END DEFINE

```

the physical, the intellectual, and the emotional. Each of these types has a different period, the physical being of 23 days, the intellectual of 33, and the emotional of 28 days.

When the current part of a cycle is positive, then we are in a better state, so a positive emotional wave would correspond with a feeling of well-being. Conversely, if your emotional wave is in a negative phase, you may feel down. The physical and intellectual waves follow a similar pattern.

Zero days!

The days when a wave crosses from positive to negative are termed 'zero' days, and spell trouble!

The accompanying program calculates your

age (in days) and then finds the state of your biorhythms, drawing a graph of the following month's cycles. It also gives a short resume of the general meaning of your present cycle.

Biorhythm Calculator

Linear Regression

Linear regression is a powerful statistical tool for determining **linear relationships between parameters or variables**. In simple terms, linear regression determines the equation of a straight line, $Y=mX+c$, for variables X and Y using mathematical formula (see **Equation Box**). This avoids having to plot the data on graph paper, drawing the 'best fit' line through the plotted data and finally determining both the slope (m) and the y-axis intercept (c) from the graph (see **Graph one**).

A Straight Line

As an undergraduate, determining the equation of a straight line, $Y=mX+C$ (graph one) using linear regression was very important in the analysis and interpretation of both my chemistry and physics experimental data. Linear regression analysis was preferred to the X-Y plot method because it saved a

Graph Four - The simplest graph - out of sequence for space reasons.

lot of time and effort. Once the equation was derived, I could substitute any X value into the equation to calculate the corresponding Y value without having to revert to the less accurate X-Y plot. The same holds true when calculating the X value from known Y values, however, the equation has to be rearranged, for example as $X=(Y-c)/m$.

In the early years of home computing, games dominated the software output of most programmers. However, my need for a linear regression program was immediate. After comparing Fortran regression listings with the regression equations I was able to write a suitable linear regression program using ZX Spectrum Basic. The resultant linear regression program was very simple, but a bit slow as a result of the ZX Basic interpreter. As my statistical and reporting demands increased, the size of the program increased too, at the expense of speed.

My upgrade to the superior and faster Memotech

AF Wilson presents a statistical solution with Abacus.

Linear Regression Worksheet Template for PSION Abacus

Listing (revised 1992):

```
[A1] "Linear Regression Worksheet by A.F.Wilson 1989"
[A2] rept("-",45)
[A4] "Follow key presses after colons."
[A6] "Data Input Section      :"
[A8] "Display Regression Results:"
[A10] "Print Regression Results  :"
[A12] "Save Worksheet           :"
[A14] "Load Worksheet           :"
[A16] "Export Data to Easel     :"
[A18] "Reset Worksheet data    :"
```

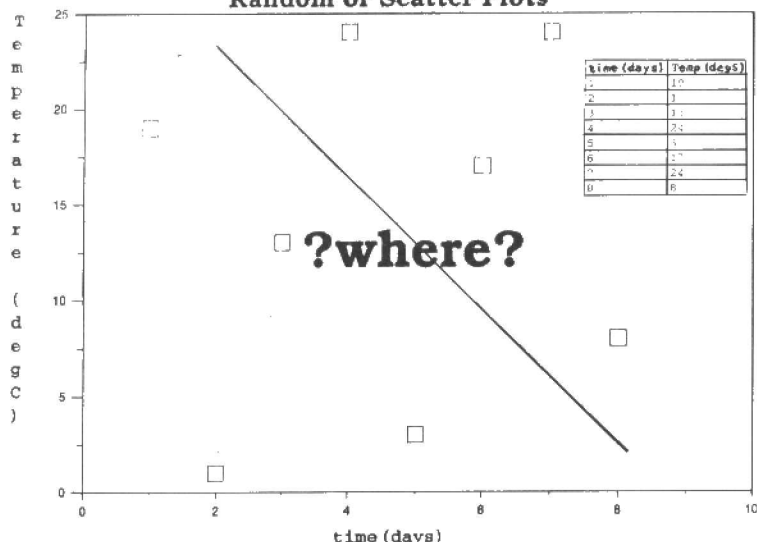
```
[D6] "F5 A25
[D8] "F5 H2
[D10] "F3 P D H1:N20
[D12] "F3 S filename
[D14] "F3 L filename
[D16] "F3 F E E range <ENT> C filename
[D18] "F3 R A34:A131 and F3 R B32:C131
```

```
[A25] "Linear Regression Data Input Section
[A26] rept("-",36)
[A28] rept("-",77)
[A29] "NUMBER
[A30] "of points
[A31] rept("-",77)
[A32] 1
[A33] A32+1
```

```
[B29] "X-DATA"
[C29] "Y-DATA"
[D29] "SUM (MEAN)"
[D30] "- X-DATA)"
[E29] "SUM (MEAN)"
[E30] "- Y-DATA)"
[F29] "top line"
[F30] "of Corr C."
[G29] "SUM of"
[G30] "ERRORS"
```

```
[A132] rept("-",77)
[A134] rept("-",77)
[A133] count(A32:A131)
[B133] sum(B32:B131)
[C133] sum(C32:C131)
[D133] sum(D32:D131)
```

Graph 4
Random or Scatter Plots



[E133] sum(E32:E131)
[F133] sum(F32:F131)
[G133] sum(G32:G131)

F3 E A33 A34:A43

[B32] 278
[B33] 283
[B34] 288
[B35] 293
[B36] 298
[B37] 303
[B38] 308
[B39] 313
[B40] 318
[B41] 323
[B42] 328
[B43] 333

[C32] 1.304
[C33] 1.290
[C34] 1.285
[C35] 1.277
[C36] 1.265
[C37] 1.255
[C38] 1.242
[C39] 1.236
[C40] 1.217
[C41] 1.207
[C42] 1.199
[C43] 1.183

MTX computer in 1984 resulted in a rewrite of the linear regression program. The rewrite included a polynomial equation solver, screen X-Y plot and machine code graphics print dump utility. The MTX regression program was a trusty servant until my MTX gave up in 1989. My replacement was the Sinclair QL: however, the thought of converting the MTX Basic/Z80 machine code regression program to SuperBasic/68K machine code was daunting.

Not Easel

A friend suggested using **Psion Abacus and Easel** for linear regression and X-Y plot output respectively. The linear regression worksheet was quickly designed (see the **Listings**). Unfortunately, Easel lacked the ability to plot X-Y graphs. The X-Y plot was not essential as a result of the detailed linear regression summary produced (see the **Report Box**). However, I did include an export option to

Easel in case someone provided a Easel X-Y plot extension, like the TurboQuill+ scroll enhancements for Quill.

Even if Easel provided a X-Y plot option like the mainstream PC compatible spreadsheets (see **Graph two**), some drawing skills are still needed. First you have to reprint the graph with symbols only, no connecting lines between the data points. Then draw the 'best fit straight line' through the plotted data (see **Graph three**). The slope (m) and intercept (c) can then be determined (see **Graph one**).

As I stated in my opening remarks, linear regression is an important analytical tool in business and science for forecasting, trending and determining relationships between variables (such as the effect of increased advertising (x) on sales (y)). Linear regression is not limited to the simple X-Y case described above and can be extended to include multiple linear regression analysis. For example, sun tan oil sales (y) will be dependent on a number of factors - advertising (x1), the effect of the weather (x2) and competitor product promotions (x3).

The quality of the experimental, test, questionnaire or sales data is important for accurate forecasting or prediction of information, such as, will it rain at the weekend? Or will the stock market crash? Or whatever. Also one must apply common sense when viewing or interpreting plotted or analysed data. For instance, a straight line can be drawn through data plotted in **Graph four**; however, as any intelligent person can see, there is no

Equation Box:

$$\text{Slope (m)} = \frac{n\sum xy - \sum x \sum y}{n\sum x^2 - (\sum x)^2}$$

$$\text{Intercept (c)} = \frac{\sum x^2 \sum y - \sum x \sum xy}{n\sum x^2 - (\sum x)^2}$$

$$\text{Corr. Coef. (r)} = \frac{n\sum xy - \sum x \sum y}{[(n\sum x^2 - (\sum x)^2)(n\sum y^2 - (\sum y)^2)]^{0.5}}$$

where n = number of points and $\sum$ = summation term

relationship or correlation between this data. This is sometimes called a RAN-DOM or scatter plot.

The linear regression

worksheet also determines the amount of randomness or scatter as the correlation coefficient (r) without having to plot the data. For

[D32] IF(B32>0,(B32-(B133/\$A133))*(B32-(B133/\$A133)),0)

F3 E D32 D33:D131

[E32] IF(C32>0,(C32-(C133/\$A133))*(C32-(C133/\$A133)),0)

F3 E E32 E33:E131

[F32] IF(B32>0 OR C32>0,(B32-(B133/\$A133))*(C32-(C133/\$A133)),0)

F3 E F32 F33:F131

[G32] IF(B32>0 OR C32>0,((C32-(C133/\$A133))-((F133/(D133+1E-18))*(B32-(B133/\$A133))))*((C32-(C133/\$A133))-((F133/(D133+1E-18))*(B32-(B133/\$A133))))),0)

F3 E G32 G33:G131

F3 X

[H2] "Linear Regression Results of"

[H3] "rept("-",26)

[H5] "Number of Observations (points) is"

[H7] "Number of Degrees of Freedom is"

[H9] "The Slope of the Line (m) is"

[H11] "The Correlation Coefficient (r) is"

[H13] "The Y-axis Intercept (c) is"

[H15] "Standard Deviation of Points from Line is"

[H17] "Standard Error of Slope is"

[H19] "Standard Error of Intercept is"

[H21] "Return to Main Menu : F5 <ENT>"

[L5] A133

[L7] IF(A133<30,A133-2,A133-1)

[L9] F133/(D133+1E-18)

[L11] IF(D133>0,F133/SQR((D133*E133)+1E-18),1)

[L13] (D133*C133-B133*F133)/(A133*D133)

[L15] IF(A133<30,SQR(G133/(A133-2)),SQR(G133/A133))

[L17] L15/SQR(D133+1E-18)

[L19] L15*SQR((1/A133)+(B133^2)/(A133^2)/(D133+1E-18))

Report Box:

Number of Observations (points)	is	12
Number of Degrees of Freedom	is	10
The Slope of the Line (m)	is	-0.002165
The Correlation Coefficient (r)	is	-0.9965184
The Y-Axis Intercept (c)	is	1.90808485
Standard Deviation of Points from Line	is	0.00342485
Standard Error of Slope	is	0.00005728
Standard Error of Intercept	is	0.01752697

instance, a correlation coefficient of 0 is RANDOM, whereas correlation coefficient of +1 or -1 means that all the plotted data lies on a straight line. The sign of a correlation coefficient just indicates the direction of the slope, see Graphs 1 and 3 respectively. Only in a perfect world do we see correlation coefficients of 1. Typically, correlation coefficient are 0.85 to 0.95.

Throughout the text I have used the phrase 'best fit to a straight line'. If you square the percent correlation coefficient term, the resultant value is a measure of the 'best fit to a straight line' (r^2). For example, a correlation coefficient of 0.95 gives a best fit or r^2 of 90% ($(0.95 \times 0.95) \times 100$) which means that 90% of the data points lie on the line.

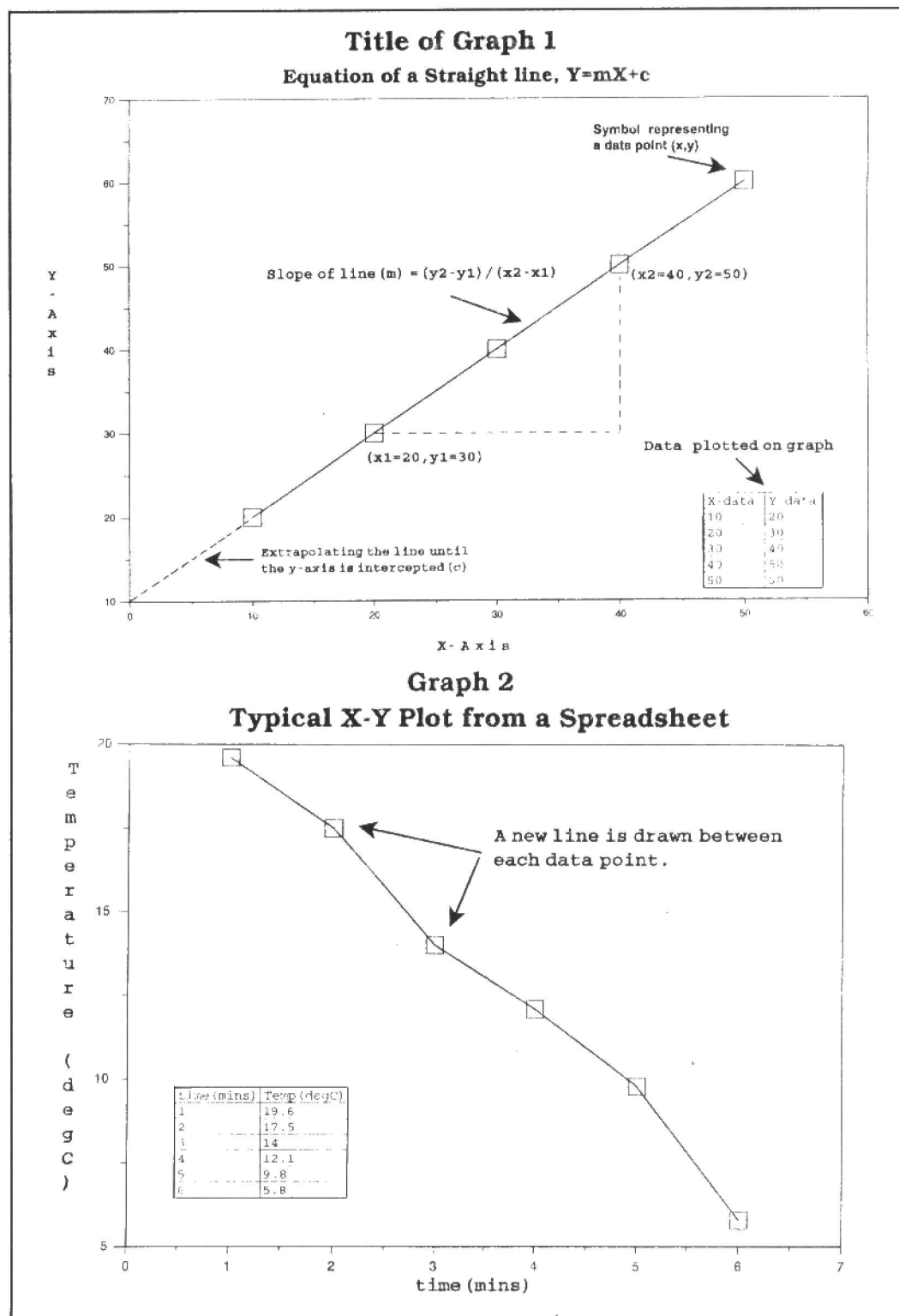
The Abacus linear regression worksheet report includes a number of other important statistical analyses (see **Report Box**). The standard deviation and errors in both the slope and intercept are a good measure of how well the data approximates to $Y=mX+c$. The bigger the standard deviation and errors then the less confident we are in using the $Y=mX+c$ model to predict future values of X and Y.

Draw tram lines either side of and in parallel to the 'best fit straight line' at 1%, 5% and 10% intervals. The tram line gap is a visual representation of our prediction confidence. If all the data falls within the 1% confidence tram lines then we are confident in our

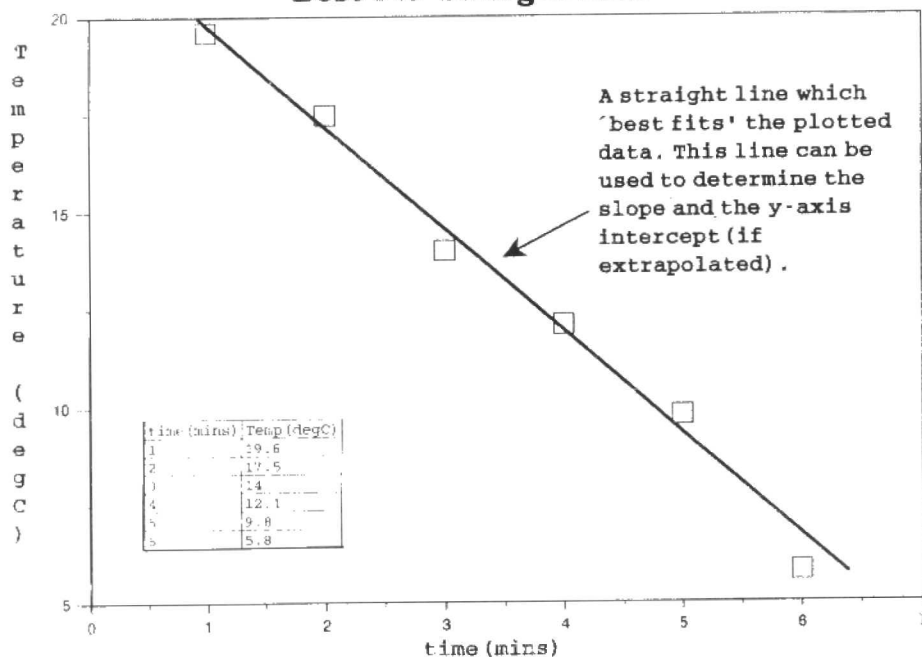
$Y=mX+c$ prediction model.

Linear regression is now standard in all mainstream spreadsheets, all statistical applications, and also available on some scientific calculators. I hope the Abacus listing rectifies this omission. A stats program for the QL is long overdue. Maybe Robin Stevenson will incorporate the linear regression routines into his archive stats listings (see QL World II.5, 'Archive Answers - Standard Deviations').

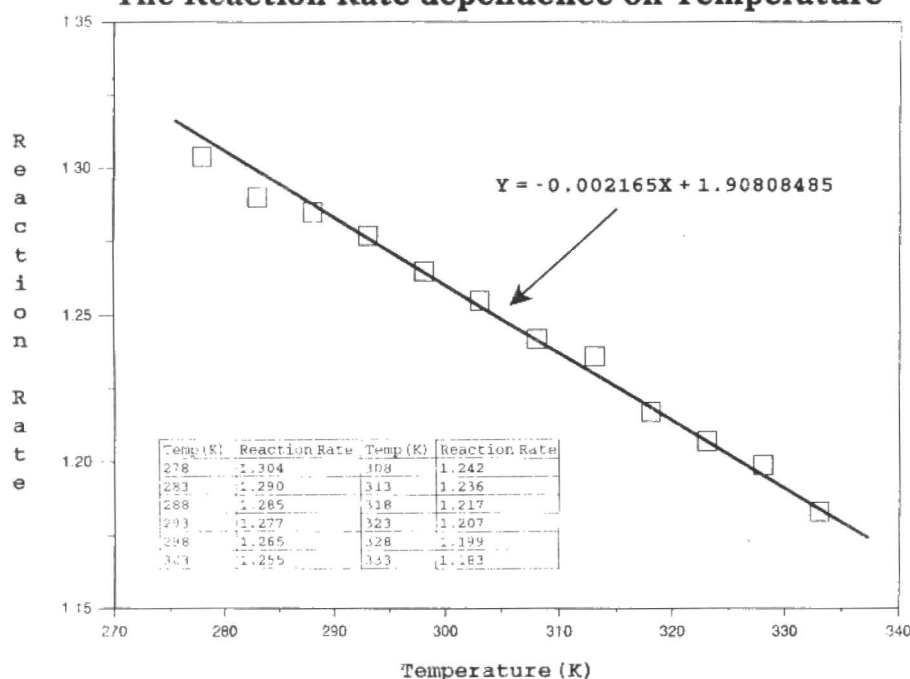
To go about using the worksheet, from step one:



Graph 3
'Best Fit' Straight Line



Graph 5
The Reaction Rate dependence on Temperature



Press the Reset button on your QL; insert Psion Abacus into mdv1_/flp1_ and put a blank formatted cartridge in mdv2_/flp2_. Press F1 or F2 depending on your VDU. Abacus will autorun. When loaded, select 64 or 80 columns and press F2 to get rid of the command table. This gives you the maximum display area.

It is necessary when typing the listing to include

some x,y data points, (see Listing) to avoid 'ERROR: division by zero', when inputting some formula. The spreadsheet was designed to handle up to 100 x,y data points. To speed up data entry, switch off autocalculate and change calculation order to COL:

F3 D A <ENT> (on/OFF toggle for autocalc)
C <ENT> (COL/row toggle for calculation order)

Now type the listing and save to microdrive/floppy as either mdv2_LINREG_aba or flp2_LINREG_aba. The moment of truth has arrived: press the keys F3-X to execute the example regression. The report summary on the screen should match the one in the **Report Box**. Otherwise, you have made a mistake. The above x,y data gives the following

equations:

$$y = -0.0022x + 1.91$$

$$x = (y-1.91)/-0.0022$$

or

$$y = -0.002165x + 1.908$$

$$x = (y-1.908)/-0.002165$$

depending upon the the accuracy of the analysis. Generally, the accuracy can be no greater than the input. In this case quoting more than 3 decimal places is pointless (see the table with **Graph five**).

It is very important to take care when rounding up as this can greatly affect your equation and the accuracy of the subsequent analysis. The graphical method will have the same accuracy as the rounding. Generally, only report the slope and intercept to the same number of decimal places as the inputted data and use scientific notation where possible, eg 0.002165 becomes 2.165e-3.

As another example, take any two points from the above data and substitute them into the above equations, the results of which are given below:

$$x=303, y = -0.0022*303 + 1.91 = 1.243$$

$$x=303, y = -0.002165*303 + 1.908 = 1.252$$

$$x=303, y \text{ measured} = 1.255$$

$$y=1.207, x = (1.207-1.91)/-0.0022 = 319.5$$

$$y=1.207, x = (1.207-1.908)/-0.002165 = 323.8$$

$$y=1.207, x \text{ measured} = 323.0$$

After LINREG_aba has been fully debugged, rubout the data points and save the linear regression spreadsheet template to microdrive/floppy disk:

F5 A1<ENT>

F3 R

A34:A131<ENT> (rubout data points)

F3 R B32:C131<ENT>

F3 X

F3 S flp2_LINREG_aba <ENT>

Note that when LINREG_aba is loaded into Abacus it should default to the menu page.

DJC

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100 REMark SuperBASIC in Action QDOS FILE
REQUESTER
110 REMark By Simon N Goodwin for Sinclair
QL World
120 REMark Version 2.0, May/June 1994;
Toolkit usage:
130 REMark ALCHP, ANYOPEN%, CHAN_W%, CURSEN,
CURDIS, EDIT$, FPOS, FLEN,
135 REMark GetHEAD, INPUT$, MORE,
MOVE_MEMORY, NEWCHAN%, RECHP, REPORT,
140 REMark RENAME, SET_POSITION,
SET_PRIORITY, SPL, SPL_USE, STRING%,
150 REMark SUSPEND_TASK, TYPE_IN
160 REMark Two TURBO compiler optimisation
directives follow:
170 IMPLICIT% current, i,j,k,n,d,type,
row,pixelLine
180 DATA_AREA 40
190 :
200 max_files%="480 *MaxFiles" :REMark
Generous for /20K disks
210 name_Limit%=36 :REMark Standard maximum
for Qdos directories
220 sorting=1 : picking=1
230 size_x%="0 *XcSize" :REMark 0 or 2 in
MODE 8/12; 0 to 2 in MODE 4
240 size_y%="0 *YcSize" :REMark
Configurable to 0 or 1 (double height)
250 dir_type%="255 *DirFileType" :
type_mask%=255 : pick_mask%=256
260 SPL_USE "ser1" :REMark Target device for
PRINT spooling (or PRT1)
270 :
280 WINDOW #0,480,40,24,216 : PAPER #0,0
290 WINDOW 476,216,24,0 : PAPER 0 : INK 7 :
BORDER 2,2
300 CLOSE : MODE 4 : REMark or 8 or 12 if
sizes permit
310 WINDOW 0 : STOP
320 :
330 REFERENCE path$,dir$(0,0),flag%(0)
340 DEFine PROCedure NEW_VIEW(status%,edge
%,path$,top%,text_Lines%,dir$,flag%)
350 REMark SuperBasic in Action Requester
modified for Qdos BROWSER
360 REMark STATUS% = report window # (2 by
36 characters or more)
370 REMark EDGE% = X offset, TEXT_LINES% =
eponymous window height
380 REMark MARK% = select default; PATH$ =
drive/directory
390 REMark TOP% = first pixel line; opens
#MENU% & #SCROLL_BAR%
400 LOCAL margin% :REMark LOCAL width
%,height%,border_colour% etc.
410 GOSUB #status%,size_x%,size_y%
420 char_x%=CHAN_W%(#status%,38)
430 char_y%=CHAN_W%(#status%,40)
440 :
450 menu%=NEWCHAN%
460 border%="3 *BorderWidth" :
border_colour%="30 *BorderColour"
470 width%=char_x% * (name_Limit%+1) +
border% * 4
480 height%=char_y% * text_Lines% + border%
* 2
490 margin%=edge%-border%*2
500 OPEN #menu%,"SCR_" &width% &"x" &height%
&"a" & margin% &"x" &top%
510 :
520 scroll_bar%=NEWCHAN%
530 OPEN #scroll_bar%,"SCR_8x" &height% &"a"
&(2+width%+margin%)&"x"&top%
540 PAPER #scroll_bar%,2
550 width%=width% - border% * 4
560 :
570 mark%=0
580 GET_DIR
590 here%=0 : Line%=here%
600 TIDY_MENU
610 IF sorting : SHELL_SORT
620 FILL_WINDOW here%
630 END DEFine NEW_VIEW
640 :
650 REFERENCE path$,dir$(0,0),flag%(0)
660 DEFine PROCedure SELECTOR(status
%,path$,text_Lines%,dir$,flag%)
670 REMark Parameters as above, but fewer;
uses MENU% & SCROLL_BAR%
680 CURSEN #status%
690 CHOOSE
700 END DEFine SELECTOR
710 :
720 DEFine PROCedure GET_DIR
730 LOCAL dir%,length%,name$(name_Limit
%),head$(64)
740 dir%=ANYOPEN%(path$,4)
750 IF dir%>0
755 CLC #status%
760 PRINT #status%;"Reading directory"!
path$
770 free%=1
780 :
790 REPEAT seek
800 IF EOF(#dir%) THEN EXIT seek
810 head$=INPUT$(#dir%,64)
820 IF head$(1 TO 16)=FILL$
(CHRS(0),16) : NEXT seek
830 flag%(free%)=CODE(head$(6)) || mark%
840 length%=STRING$(head$(15 TO 16))
850 name$=head$(17 TO 16+length%)
860 IF flag%(free%)=dir_type% :
name$=name$ & " ->"
870 dir$(free%)=name$
880 free%=free%+1
890 IF free%>max_files% THEN EXIT seek
900 END REPEAT seek
910 :
920 CLOSE #dir%
930 END IF
940 flag%(0)=dir_type% :REMark || pick_mask%
950 IF "_" INSTR path$ = LEN(path$)
960 dir$(0)("<- DRIVE0"
970 ELSE
980 dir$(0)("<- PARENT"
990 END IF
995 IF NOT sorting : COMMANDS com_code%
1000 END DEFine GET_DIR
1010 :
1020 DEFine PROCedure SHELL_SORT
1030 LOCAL i,j,k,n,d,passes,z%,z$(name_Limit
%)
1040 n=free%-1
1050 IF n=2
1060 IF dir$(1)>dir$(2)
1070 z$=dir$(1) : z%=flag%(1)
1080 dir$(1)=dir$(2) : flag%(1)=flag%(2)
1090 dir$(2)=z$ : flag%(2)=z%
1100 END IF
1110 END IF
1120 IF n>2
1130 d=1 : passes=0

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1140 REPEAT size
1150   d=3*d
1160   IF d>n : EXIT size
1170   passes=passes+1
1180 END REPEAT size
1190 IF passes>2
1200   PRINT #status%!!"Sorting"!
n!"names"!
1210 END IF
1220 d=d DIV 2
1230 REPEAT pass
1240   PRINT #status%!!passes!
1245   passes=passes+1
1250   d=d DIV 3
1260   FOR i=1 TO d
1270     FOR j=i TO n-d STEP d
1280       z$=dir$(j+d) : z%=flag%(j+d)
1290       FOR k=j TO 0 STEP -d
1300         IF z$>=dir$(k) THEN EXIT k
1310         dir$(k+d)=dir$(k)
1320         flag%(k+d)=flag%(k)
1330       END FOR k
1340       dir$(k+d)=z$
1350       flag%(k+d)=z%
1360     END FOR j
1370   END FOR i
1380   IF d=1 THEN EXIT pass
1390 END REPEAT pass
1400 END IF
1410 COMMANDS com_code% : REMark CLS #status
%
1420 END DEFINE SHELL_SORT
1430 :
1440 DEFINE PROCEDURE FILL_WINDOW(from%)
1450 LOCAL n
1460 CLS #menu%
1470 FOR n=from% TO MINIM%(from%+text_Lines
%,free%)-1
1480   ECHO_NAME n
1490 END FOR n
1500 AT #menu%,Line%,0
1510 END DEFINE FILL_WINDOW
1520 :
1530 DEFINE PROCEDURE ECHO_NAME(n%)
1540 IF flag%(n%) && pick_mask%
1550   PAPER #menu%,2 : ELSE PAPER #menu%,0
1560 END IF
1570 IF dir_type%=(flag%(n%) && type_mask%)
1580   INK #menu%,7 : ELSE INK #menu%,4
1590 END IF
1600 PRINT #menu%,dir$(n%) : CLS #menu%,4
1610 IF flag%(n%) && pick_mask% : PAPER
#menu%,0
1620 END DEFINE ECHO_NAME
1630 :
1640 DEFINE PROCEDURE TIDY_MENU
1650 BORDER #menu%,0
1660 CLS #menu%
1670 CSIZE #menu%,size_x%,size_y%
1680 INK #menu%,4 : PAPER #menu%,0 :REMark
Beware interaction!
1690 IF border%>1 : BORDER #menu%,border
%-1,border_colour%
1700 IF border%>0 : BORDER #menu%,border
%,128
1710 SLIDER
1720 END DEFINE TIDY_MENU
1730 :
1740 DEFINE PROCEDURE REDRAW
1750 TIDY_MENU
1760 FILL_WINDOW here%-Line%
1770 BLAT Line%
1780 END DEFINE REDRAW
1790 :
1800 DEFINE PROCEDURE SLIDER
1810 LOCAL delta
1820 CLS #scroll_bar%
1830 IF text_Lines%>free%-1
1840   depth%=char_y% * text_Lines%
1850 ELSE
1860   depth%=(text_Lines% ^ 2 * char_y%)
DIV free%
1870 END IF
1880 IF free%>1
1890   delta=here%-Line% :REMark Ensure
decimal division
1900   offset%=(char_y% * text_Lines% *
delta )/free%
1910 ELSE
1920   offset%=0
1930 END IF
1940 REMark The slider must be at least two
pixels tall
1950 IF depth%<2
1960   depth%=2
1970   IF border%<2 THEN offset%=offset%-2
1980   IF offset%<0 THEN offset%=0
1990 END IF
2000 BLOCK #scroll_bar%,4,depth%,2,offset%
+border%,7
2010 END DEFINE SLIDER
2020 :
2030 DEFINE PROCEDURE DOWN_DIR(mark%)
2040 IF path$=""
2050   NEW_DRIVE : IF path$="" : RETURN
2060 ELSE
2070   REMark Add directory name without " -
>" suffix
2080   path$=path$ & dir$(here%,1 TO
LEN(dir$(here%))-3)
2090 END IF
2100 NEW_DIR
2110 END DEFINE DOWN_DIR
2120 :
2130 DEFINE PROCEDURE NEW_DIR
2140 GET_DIR : IF sorting : SHELL_SORT
2150 here%=0 : Line%=0 : REDRAW
2160 END DEFINE NEW_DIR
2170 :
2180 DEFINE PROCEDURE UP_DIR
2190 LOCAL i
2200 FOR i=LEN(path$)-1 TO 1 STEP -1
2210   IF path$(i)="_" : EXIT i
2220 END FOR i
2230 IF i=3
2240   REMark Remove net file server prefix
2250   IF path$(1)=="n" : i=0
2260 END IF
2270 IF i<=1
2280   path$="" : DEVICES
2290 ELSE
2300   path$=path$(1 TO i) : NEW_DIR
2310 END IF
2320 END DEFINE UP_DIR
2330 :
2340 DEFINE PROCEDURE NEW_DRIVE
2350 LOCAL key$(1),tflag%
2355 CLS #status%
2360 PRINT #status%;"Select drive number
[1..8 or ESC] : ";
2370 REPEAT drive
2380   key$=INKEY$(#status%,-1)

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2390 IF key$=CHR$(27) : CLS #status% :
RETurn
2400 IF key$>="I" AND key$<="8" : EXIT
drive
2410 END REPeat drive
2420 PRINT #status%;key$
2430 path$=dir$(here%) & key$ & "_"
2440 IF dir$(here%)=="N" : GET_REMOTE
2450 tflag%=ANYOPEN$(path$,4)
2460 IF tflag%<0
2470 MOAN "Directory " & path$ & " is not
available."
2480 path$=""
2490 ELSE
2500 CLOSE #tflag%
2510 END IF
2515 REMark COMMANDS com_code%
2520 END DEFine NEW_DRIVE
2530 :
2540 DEFine PROCedure GET_REMOTE
2550 CLS #status%
2560 PRINT #status%;"Enter remote path:"
2570 path$=EDIT$(#status%,path$,name_limit%)
2580 END DEFine GET_REMOTE
2590 :
2600 DEFine PROCedure DEVICES
2610 LOCAL start
2620 dir$(0)=""<- DEVICES"
2630 start=PEEK_L(SYSBASE+72) :REMark
Directory device list
2640 free%=1
2650 REPeat loop
2660 IF start=0:EXIT loop
2670 dir$(free%)=MPEEK$
(start+38,PEEK_W(start+36))
2680 IF LEN(dir$(free%))>0
2690 flag%(free%)=dir_type%
2700 free%=free%+1
2710 END IF
2720 start=PEEK_L(start)
2730 END REPeat loop
2740 IF sorting : SHELL_SORT
2750 here%=0 : Line%=here%
2760 REDRAW
2770 END DEFine DEVICES
2780 :
2790 DEFine PROCedure MOAN(text$)
2800 CLS #status%
2810 PRINT #status%;text$
2820 AWAIT_KEY
2840 COMMANDS com_code% :REMark CLS #status%
2850 END DEFine MOAN
2860 :
2870 DEFine PROCedure CHOOSE
2880 LOCAL k
2890 BLAT Line%
2900 SLIDER
2910 REPeat poll
2920 k=CODE(INKEY$(#status%,-1))
2930 IF k=0 THEN SUSPEND_TASK 10 : NEXT
poll
2935 kb=k :REMark Global flag
2940 SELECT ON k
2945 =12/ : SBYTES_O
raml_pic,131072,32768
2950 =208 : MOVE_UP
2960 =209 : PAGE_UP
2970 =210,213 : here%=1 : Line%=0 :
PAGE_UP
2980 =212 : PICK_NAME : MOVE_UP
2990 =216 : MOVE_DOWN
3000 =217 : PAGE_DOWN
3010 =218,221 : here%=free%-text_lines
% :Line%=0 :PAGE_DOWN
3020 =220 : PICK_NAME : MOVE_DOWN
3030 =244,250 : REDRAW
3040 =32 : PICK_NAME
3050 =10 : IF here%=0 : UP_DIR :
NEXT poll
3060 IF dir_type%=(flag%(here
%) && type_mask%)
3070 DOWN_DIR flag%(here%)
&& pick_mask%
3080 NEXT poll
3090 ELSE
3095 REMark IF (flag%(here
%) && pick_mask%)=0 : PICK_NAME
3100 ACTION com_code
%,PREFIX$(path$),dir$(here%)
3105 COMMANDS com_code% :
REMark EXIT poll
3110 END IF
3120 =27,200,192 : EXIT poll : REMark
here%=0 removed
3125 =REMAINDER : DO_COMMAND
3130 END SELECT
3140 END REPeat poll
3145 BLAT Line%
3150 END DEFine CHOOSE
3160 :
3170 DEFine PROCedure BLAT(item%)
3180 OVER #menu%,-1
3190 BLOCK #menu%,width%,char_y%,0,item% *
char_y%,5
3200 OVER #menu%,0
3210 END DEFine BLAT
3220 :
3230 DEFine PROCedure MOVE_UP
3240 IF here%>0
3250 BLAT Line%
3260 here%=here%-1
3270 Line%=Line%-1
3280 IF Line%<0
3290 SCROLL #menu%,char_y%
Line%=0 : AT #menu%,Line%,0
3300 ECHO_NAME here%
3310 SLIDER
3320 END IF :REMark Scroll down
3340 BLAT Line%
3350 END IF
3360 END DEFine MOVE_UP
3370 :
3380 DEFine PROCedure MOVE_DOWN
3390 IF here%<free%-1
3400 BLAT Line%
3410 here%=here%-1
3420 Line%=Line%-1
3430 IF Line%>=text_lines%
3440 SCROLL #menu%, -char_y%
Line%=text_lines%-1 : AT #menu
%,Line%,0
3460 ECHO_NAME here%
3470 SLIDER
3480 END IF
3490 BLAT Line%
3500 END IF
3510 END DEFine MOVE_DOWN
3520 :
3530 DEFine PROCedure PICK_NAME
3540 flag%(here%)=flag%(here%) ^^ pick_mask%
3550 AT #menu%,Line%,0
3560 ECHO_NAME here%

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3570 BLAT Line%
3580 END DEFine PICK_NAME
3590 :
3600 DEFine PROCedure PAGE_UP
3610 LOCAL top%
3620 top%=here%-Line%-text_Lines%
3630 IF top%<0 THEN top%=0 : Line%=0
3640 FILL_WINDOW top%
3650 BLAT Line%
3660 here%=top%+Line%
3670 SLIDER
3680 END DEFine PAGE_UP
3690 :
3700 DEFine PROCedure PAGE_DOWN
3710 LOCAL top%
3720 top%=here%-Line%+text_Lines%
3730 IF top%+text_Lines%>=free%
3740   Line%=(text_Lines%-1)-((free%-1)-top%)
3750   top%=free%-text_Lines%
3760   IF top%<0 THEN top%=0
3770   IF Line%>=text_Lines% : Line%=free%-1-top%
3780 END IF
3790 FILL_WINDOW top%
3800 BLAT Line%
3810 here%=top%+Line%
3820 SLIDER
3830 END DEFine PAGE_DOWN
3840 :
3850 REMark **** Simple BASIC versions of
Toolkit functions
3860 :
3870 DEFine FuNction MPEEK$(addr,len%)
3880 LOCAL p,t$(name_Limit%)
3890 t$="" : REMark Use Turbo Toolkit PEEK$
for more speed
3900 FOR p=addr TO addr+len%-1
3910   t$ t$ & CHR$(PEEK(p))
3920 END FOR p
3930 RETURN t$
3940 END DEFine MPEEK$
3950 :
3960 DEFine FuNction MINIM%(a%,b%)
3970 IF a%<b%
3980   RETURN a%
3990 ELSE
4000   RETURN b%
4010 END IF
4020 END DEFine MINIM%
4030 :
4140 REMark STRING% is in Turbo Toolkit & PD
Toolkit, & BASIC
4150 REMark in QL World; see Listing on page
17, January 1993.
4160 :
4170 DEFine PROCedure S
4180 SAVE FLPL_BROWSER2_BAS
4190 END DEFine S
4200 :
4210 REMark Subset of DIY Toolkit MINIMUM FN
for two variables
4360 DEFine FuNction MINIM(a,b)
4370 IF a<b
4380   RETURN a
4390 ELSE
4400   RETURN b
4410 END IF
4420 END DEFine MINIM
4430 :
5000 REMark Qdos BROWSER - SuperBASIC in
Action May/June 1994
5010 REMark Uses FILE REQUESTER routines
introduced last year
5020 REMark Copyright 1993,1994 Simon N
Goodwin, version 0.9
5030 :
5040 DEFine PROCedure WINDOZE(n)
5050 LOCAL i,com_code%,current,skew%
5060 REMark Windows are numbered from 0 to
n-1
5070 skew%=0 : READ_COMMANDS : com_code%=0
5080 DIM d1$(max_files%,name_Limit%),d2$(
max_files%,name_Limit%)
5090 DIM f1$(max_files%),f2$(max_files%)
5100 REMark D2, F2 etc. for more windows (or
use Minerva slices)
5110 DIM path1$(name_Limit%),path2$(
name_Limit%)
5120 DIM x$(50),y$(50),wild$(name_Limit
%),dest$(50)
5130 DIM id$(n-1,1),place%(n-1,2)
5140 path1$="flp1_tax_" : path2$="flp2_"
5150 REMark MODE 8: NEW_VIEW
#0,40,path1$,0,10,d1$,f1%
5160 NEW_VIEW #0,24,path1$,0,20,d1$,f1%
5170 id$(0,0)=menu% : id$(0,1)=scroll_bar%
5180 SAVE_WINDOW_SPEC 0
5190 REMark MODE 8: NEW_VIEW
#0,40,path2$,108,10,d2$,f2%
5200 NEW_VIEW #0,272,path2$,0,20,d2$,f2%
5210 id$(1,0)=menu% : id$(1,1)=scroll_bar%
5220 SAVE_WINDOW_SPEC 1
5230 REMark COMMANDS 0 : REMark No highlight
yet
5240 current=0 : REPEAT polly
5250   LOOK_AT current
5260   IF kb<>10 : current=1-current
5270 END REPEAT polly
5280 END DEFine WINDOZE
5290 :
5300 DEFine PROCedure LOOK_AT(k)
5310 REMark Focus on file-selector K; MODE
sensitive
5320 menu%=id$(k,0) : scroll_bar%=id$(k,1)
5330 free%=place%(k,2) : Line%=place%(k,1) :
here%=place%(k,0)
5340 SELECT ON k
5350   =0 : AT #0,0,0
5360   PRINT #0;PADDED$(path1$,name_Limit
%)
5370   SELECTOR #0,path1$,20,d1$,f1%
5380   =1 : AT #0,0,name_Limit%+5
5390   PRINT #0;PADDED$(path2$,name_Limit
%)
5400   SELECTOR #0,path2$,20,d2$,f2%
5410 END SELECT
5420 SAVE_WINDOW_SPEC k
5430 END DEFine GIMME
5440 :
5450 DEFine PROCedure SAVE_WINDOW_SPEC(n)
5460 REMark id$(n,0)=menu% : id$(
n,1)=scroll_bar%
5470 place%(n,0)=here% : place%(n,1)=Line%
5480 place%(n,2)=free%
5490 END DEFine SAVE_WINDOW_SPEC
5500 :
5510 DEFine FuNction PADDED$(text$,length%)
5520 RETURN text$ & FILL$(CHR$(32),length%-
LEN(text$))
5530 END DEFine PADDED$
5540 :

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5550 DEFine FuNction PREFIX$(text$)
5560 LOCAL i
5570 i="_" IN3TR text$
5580 IF i=0 : RETURN "" :REMark Shouldn't
happen?
5590 RETURN text$(1 TO i)
5600 END DEFine PREFIX$
5610 :
5620 DEFine PROCEDURE READ_COMMAND$
5630 REMark Initialise COM$(COM_COUNT%)
5640 RESTORE 5700
5650 READ com_count%
5660 DIM com$(com_count%,16)
5670 FOR i=1 TO com_count%
5680 READ com$(i)
5690 END FOR i
5700 DATA
13,"ALL","COPY","DELETE","EDIT","GRAPHICS"
5710 DATA
"INFO","MOVE","PRINT","QUIT","RENAME"
5720 DATA "SWAP","TEXT","WILDCARD"
5730 END DEFine READ_COMMAND$
5740 :
5750 DEFine PROCEDURE COMMAND$(this1%)
5760 PAPER #0,0 : CLS #0 : INK #0,7
5770 PRINT #0;PADDED$(path1$,name_limit%)
5780 AT #0,0,name_limit%+5 : PRINT
#0;PADDED$(path2$,name_limit%)
5790 PAPER #0,0,2,0 : PRINT #0;"Qdos Browser
1.9 CNG 1994"!
5800 REMark PAPER #0,0
5810 FOR i=1 TO com_count%
5820 PAPER #0,0 : PRINT #0!" " : INK #0,0
5830 IF this1%=i THEN PAPER #0,4 : ELSE
PAPER #0,7
5840 PRINT #0!!CHR$(32) & com$(i) &
CHR$(32)!
5850 REMark IF this1%=i THEN PAPER #0,7
5870 END FOR i
5880 PAPER #0,0 : INK #0,7
5890 BLOCK #0,480,1,0,19,0
5900 BLOCK #0,480,1,0,29,0
5910 BLOCK #0,480,1,0,39,0
5920 END DEFine COMMAND$
5930 :
5940 DEFine PROCEDURE DO_COMMAND
5950 LOCAL k$(1),j
5960 k$=CHR$(k)
5970 REMark Now try to match K$ with a
command
5980 FOR i=1 TO com_count%
5990 IF com$(i,1)=k$ : com_code%=i
6000 END FOR i
6010 IF com_code%<>0
6020 COMMAND$ com_code%
6030 IF picking : DO_BATCH
6040 COMMAND$ com_code% :REMark Update
menu
6050 END IF
6060 END DEFine DO_COMMAND
6070 :
6080 DEFine PROCEDURE ACTION(j,drive$,file$)
6090 IF j=0 : RETURN
6100 ON j GO TO
6900,7000,7100,7200,7300,7400,7500,7600,7700
,7800,7900,8000,8100
6110 MOAN "Unknown command code: " & j
6120 END DEFine ACTION
6130 :
6140 DEFine PROCEDURE DO_BATCH
6150 LOCAL dev$(name_limit%),old_here
%,old_line%,skew%,this1%
6160 dev$=PREFIX$(path$) :REMark Save
function calls later
6165 skew%=0 : old_here%=here% : old_line
%=line% : BLAT Line%
6170 FOR i=1 TO free%-1
6175 this1%=i+skew% :REMark Compensate for
movement
6180 IF flag%(this1%) && pick_mask%
6182 UPDATE this1% :REMark Ensure this
one is displayed
6185 IF INKEY$(#0,20)=CHR$(27) : MOAN
"Escape typed.": EXIT i
6190 ACTION com_code%,dev$,dir$(this1%)
6200 flag%(this1%)=flag%(this1%)-
pick_mask%
6210 UPDATE i: PAUSE 1 : PAUSE 1 :REMark
Debounce
6220 IF INKEY$(#0,18)=CHR$(27) : MOAN
"Escape typed.": EXIT i
6230 END IF
6240 END FOR i
6245 here%-old_here% : Line%=old_line%
6247 UPDATE here%
6248 BLAT Line%
6250 END DEFine DO_BATCH
6260 :
6370 REFERENCE a$,b$
6380 DEFine PROCEDURE
PART$(first$,last$,a$,b$)
6390 IF path$=path1$
6400 dest$=path2$
6410 ELSE
6420 dest$=path1$
6430 END IF
6440 a$=first$ & last$
6450 b$=dest$ & last$(1+LEN(path$)-
LEN(first$) TO LEN(last$))
6460 END DEFine PART$
6870 :
6880 REMark Start of ACTION subroutines
6890 REMark ALL
6900 FOR i=1 TO free%-1
6910 flag%(i)=flag%(i) || pick_mask%
6920 END FOR i
6930 REDRAW
6940 RETURN
6980 :
6990 REMark COPY
7000 PART$ drive$,file$,x$,y$
7010 PRINT #0\\"Copying"!x$!"to"!y$
7020 COPY x$ TO y$ :REMark Optimise this
later
7025 REMark Update target array and screen
7030 RETURN
7040 :
7090 REMark DELETE
7100 PRINT #0\\"Deleting"!drive$ & file$
7110 DELETE drive$ & file$
7120 FOR n=here% TO free%-2
7130 dir$(n)=dir$(n+1)
7140 flag$(n)=flag$(n+1)
7150 END FOR n
7155 skew%=skew%-1 : free%=free%-1
7160 IF here%>=free%
7162 here%=free%-1
7163 Line%=MINIM%(text_lines%-1,free%-1)
7169 END IF
7175 REDRAW
7180 RETURN
7185 :

```

```

7190 REMark EDIT
7200 CURDIS #0 :REMark Allow task to grab
keyboard input
7205 EXEC "FLPI_HTCOFT" :REMark For example
Hicsoft Devpac 2
7210 SUSPEND_TASK 20 : TYPE_IN CHR$(10) &
CHR$(255) & "L"
7220 SUSPEND_TASK 20 :REMark Wait for
filename input window
7230 TYPE_IN drive$ & file$ &
CHR$(10):REMark File to load
7240 CURSEN #0
7270 RETURN
7280 :
7290 REMark GRAPHICS
7300 SAVE_SCREEN
7305 ch%=NEWCHAN%
7310 OPEN_IN #ch%,drive$ & file$
7320 MORE_GRAPHICS
7350 CLOSE #ch%
7360 RESTORE_SCREEN
7370 RETURN
7380 :
7390 REMark Show INfOrMation about file
7400 SHOW_INFO drive$ & file$
7405 RETURN
7410 :
7490 REMark MOVE
7500 GO SUB 7000 :REMark Copy
7510 GO TO 7100 :REMark Delete original
7540 :
7590 REMark PRINT to default SPL device
7600 SPL drive$ & file$ : RETURN
7610 :
7690 REMark QUIT
7700 FOR i=0,1
7710   FOR n=0,1
7720     CLOSE #id$(i,n)
7730   END FOR n
7740 END FOR i
7750 REMark Recover screen?
7760 MODE 4
7770 STOP
7780 :
7790 REMark RENAME
7800 MOAN "RENAME doesn't work yet." :
RETURN
7810 :
7890 REMark SWAP
7900 MOAN "SWAP doesn't work yet." : RETURN
7910 :
7990 REMark "TEXT" action routine
8000 SAVE_SCREEN
8010 INK #0,4
8020 PRINT #0;"DIY Toolkit MORE file viewer
- use keys"
8030 PRINT #0;"[?] to move, -ALT for pages,
ESC to Exit"
8040 INK #0,7
8050 MORE drive$ & file$ : RESTORE_SCREEN :
CURSEN #0 : RETURN
8060 :
8090 REMark WILDCARD cumulative selection
8100 CLS #0
8110 INPUT #0;"Enter wildcard pattern to
match:"!wild$\\
8120 IF LEN(wild$)>0
8130   FOR i=1 TO free%-1
8140     IF wild$ INSTR dir$(i)
8150       flag$(i)=flag$(i) || pick_mask%
8160       PRINT #0;dir$(i)
8170     END IF
8180   END FOR i
8190 ELSE
8200   FOR i=1 TO free%-1
8210     flag$(i)=flag$(i) && type_mask%
8220   END FOR i
8230 END IF
8240 REDRAW
8250 CURSEN #0 : RETURN
8260 :
8270 DEFINE PROCEDURE SAVE_SCREEN
8280   screen_snap=ALCHP(32768)
8290   IF screen_snap>0
8300     MOVE_MEMORY SCREEN_RAM TO
screen_snap,32768
8310     CLS : BORDER 2,5 : PAPER #0,0 : CLS
#0
8320   END IF
8330 END DEFINE SAVE_SCREEN
8340 :
8350 DEFINE PROCEDURE RESTORE_SCREEN
8360   IF screen_snap>0
8370     MOVE_MEMORY screen_snap TO
SCREEN_RAM,32768
8380     RECHP screen_snap
8390     screen_snap=0 :REMark Be careful!
8400   ELSE
8410     REMark   Redraw some other way
8420   END IF
8430 END DEFINE RESTORE_SCREEN
8440 :
8450 DEFINE FUNCTION SCREEN_RAM
8460   REMark Second screen is controlled by
bit 7 of SV.MCSTAT
8470   RETURN 131072 + 32768 *
(PEEK(SYSEBASE+52)>12/)
8480 END DEFINE SCREEN_RAM
8490 :
8500 DEFINE PROCEDURE SHOW_INFO(name$)
8510   LOCAL buffa,type,ch%
8520   buffa=ALCHP(64)
8530   IF buffa>0
8540     ch%=NEWCHAN%
8550     OPEN_IN #ch%,name$
8560     GETHEAD #ch%,buffa
8570     CLS #0
8580     PRINT #0\\"file$!"is " &
PEEK_L(buffa)"bytes,"!
8590     PRINT #0!"dated"!DATE$
(PEEK_L(buffa+52)) & ";!
8600     IF PEEK(buffa+4) : PRINT
#0!"protected"!
8610     type=PEEK(buffa+5)
8620     SELECT ON type
8630       =0 : PRINT #0!"data file."
8640       =1 : PRINT #0!"task, dataspace"!
PEEK_L(buffa+6)&"."
8650       =2 : PRINT #0!"object link file."
8660       =3,255 : PRINT #0!"sub-directory."
8665       =4 TO 11:PRINT #0!"Speculator type
" & type
8670       =REMAINDER : PRINT #0!"exotic type
" & type & "!"
8680     END SELECT
8690     CLOSE #ch%
8700     RECHP buffa
8710     AWAIT_KEY
8720   END IF
8730 END DEFINE SHOW_INFO
8740 :
8750 DEFINE PROCEDURE AWAIT_KEY

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```

8755 LOCAL k$(2)
8760 PRINT #0\\ "Please press a key to
continue ..."
8770 k$=INKEY$(#0,1) & INKEY$(#0,1) & INKEY$(#0,-1)
8780 END DEFine AWAIT_KEY
8790 :
8800 REFERENCE table$(0),f$(0)
8810 DEFine PROCEDURE ADD_FILE(table$,f$,i)
8820 LOCAL pos%,t
8830 REMark Puts current entry I in the
correct slot in TABLE$
8840 IF free%>max_files%
8850 MOAN "Browser's directory table is
full."
8860 ELSE
8870 IF free%=i OR NOT sorting
8880 REMark Add name to end of table
8890 pos%=free%
8900 table$(free%)=name$: f%(free
%)=type_mask% && flag$(i)
8910 ELSE
8920 REMark Insert in space determined
by binary chop
8930 pos%=BINARY_CHOP%(dir$(i),table$)+1
:REMark After match
8940 REMark Move later elements down
from POS%
8950 FOR i=tree%-1 TO pos% STEP -1
8960 table$(i+1)=table$(i) : f%(i+1)=f
%(i)
8970 END FOR i
8980 END IF
8990 REMark Insert new element at POS%
9000 table$(pos%)=dir$(i) : f%(pos
%)=type_mask% && flag$(i)
9010 tree%=free%+1
9020 REMark Re-display target directory
9030 END IF
9040 END DEFine ADD_FILE
9050 :
9060 DEFine PROCEDURE UPDATE(record%)
9070 REMark Redisplay record%, redraw if
necessary
9080 LOCAL top%
9090 top%=here%-line%
9100 IF record%>=top% AND record%<top%
+text_lines%
9110 AT #menu%,line%,0
9120 ECHO_NAME record%
9130 ELSE
9140 REMark Redraw on a new page
9150 top%=record%
9160 IF top%+text_lines%>=free%
9170 REMark Last page, ensure it is full
9180 top%=free%-text_lines%
9190 END IF
9200 FILL_WINDOW top%
9210 END IF
9220 END DEFine UPDATE
9230 :
9240 DEFine PROCEDURE MORE_GRAPHICS
9250 LOCAL
aPage,k,k$(10),lines,fileLen,row,target,top
9260 REMark Reads graphics from #ch% & sends
prompts to #0
9270 REMark Display is full-screen width in
#1 vertical area
9280 REMark Assumes 128 byte lines in file &
video memory
9290 REMark Uses current screen in Minerva
F3/F4 64K mode
9300 top=CHAN_W%(#1,26) :REMark First line
of Window
9310 lines=CHAN_W%(#1,30) :REMark Window
pixel height
9320 fileLen=FLEN(#ch%) : aPage=lines*128
:REMark Bytes/Page
9330 INK #0,4
9340 PRINT #0;"Browser Graphics file viewer
- use keys"
9350 IF aPage>=fileLen
9360 PRINT #0;"ENTER, SPACE or ESC to
return to the menu"
9370 ELSE
9380 PRINT #0;"?% to move, +ALT for pages,
ESC to Exit"
9390 END IF
9400 INK #0,7 : AT #0,2,0 :REMark Backdrop
for prompt
9410 PRINT #0;MINIM(aPage,fileLen)," of"!
fileLen!"in"!file$;
9420 REPEAT page_view
9430 FOR row=top TO top+lines-1 :
GRAPHICS_LINE row
9440 IF aPage>=fileLen : k$=INKEY$(#0,-1) : EXIT page_view
9450 REPEAT fine_view
9460 AT #0,2,0
9470 PRINT #0;FPOS(#ch%)," ";
9480 k=CODE(INKEY$(#0,-1))
9490 SELECT ON k
9500 =27 : EXIT page_view
9510 =10 : AT #0,2,0 : k$=EDIT$(#0,FPOS(#ch%),10)
9520 CURSEN #0 : IF "ee" INSTR k$ :
NEXT fine_view
9530 IF k$="" : NEXT fine_view
9540 IF k$<"C" OR k$>fileLen & "" :
NEXT fine_view
9550 SET_POSITION #ch%,k$ : EXIT
fine_view
9560 =209 : target=FPOS(#ch%)-
lines*128*2
9570 IF target<0 : target=0 :
REMark Page to top
9580 SET_POSITION #ch%,target :
EXIT fine_view
9590 =217,32 : REMark Page down, easy
default case
9600 =216 : target=top*128+SCREEN_RAM
9610 MOVE_MEMORY target+128 TO
target,(lines-1)*128
9620 GRAPHICS_LINE top+lines-1 :
NEXT fine_view
9630 =REMAINDER : SUSPEND_TASK 10 :
NEXT fine_view
9640 END SELECT
9650 EXIT fine_view
9660 END REPEAT fine_view
9670 END REPEAT page_view
9680 END DEFine MORE_GRAPHICS
9690 :
9700 DEFine PROCEDURE
GRAPHICS_LINE(pixelLine)
9710 LOCAL left,target
9720 left=fileLen-FPOS(#ch%)
9730 target=SCREEN_RAM+128*pixelLine
9740 SELECT ON left
9750 REMark If the file is exhausted, show
a stripey pattern
9760 #0 : POKE$ target,FILL$

```



```

(CHRS$(2^(pixelLine && 7)),128)
9770   =1 TO 127 :REMark One incomplete line
remains; pad it
9780   POKE$ target,INPUT$(#ch%,left) &
FILL$(CHRS$(0),128-left)
9790   =REMAINDER : POKE$ target,INPUT$(#ch
%,128) :REMark 1 line
9800 END SELECT
9810 END DEFine GRAPHICS_LINE
9820 :
9830 REFERENCE table$(0)
9840 DEFine FuNction BINARY_CHOP%
(name$,table$)
9850 LOCAL i:REMark first%,last%,pos%
9860 REMark Determine location by binary
chop (NOT!)
9870 FOR i=1 TO free%-1
9880   IF name$<table$(i) : EXIT i
9890 END FOR i
9900 RETURN i-1
9910 END DEFine BINARY_CHOP%
9920 :
32000 DEFine PROCedure FIND(n$)
32010 REMark DIY Toolkit version, uses
BPEEKs & LOOKUP%
32020 LOCAL pos,type,details
32030 pos=LOOKUP%(n$)
32040 IF pos<0
32050   PRINT #0,"FIND " & n$ & " failed: ";
32060   REPORT pos
32070 ELSE
32080   details=BPEEK_L(24)+pos*8
32090   IF BPEEK%(details)<4 OR BPEEK%
(details)>5
32100   PRINT #0;n$;" is not a Basic
definition!"
32110   ELSE
32120     CLS #2
32130     LIST BPEEK_W%(details+4) TO
BPEEK_W%(details+4)+100
32140   END IF
32150 END IF
32160 END DEFine FIND
32170 :
32180 DEFine PROCedure HOW_COME
32190 REMark DIY Toolkit version
32200 REMark Print contents of RETURN stack
(non-destructively)
32210 LOCAL rtstart,rtend,i
32220 CLS 2:PRINT
32230 rtstart=BPEEK_L(56)
32240 rtend=BPEEK_L(60)
32250 REMark IF (rtend-rtstart) MOD 24 THEN
RETURN
32260 i=rtstart
32270 REPEAT scan_rt
32280   i=i+24
32290   IF i>rtend-24 THEN EXIT scan_rt
32300   IF BPEEK_W%(i+18) THEN
32310     PRINT "Call at ";BPEEK_W%(i+18);
in ";
32320   ELSE
32330     PRINT "Stop at ";BPEEK_W%(i+18);
in ";
32340   END IF
32350   IF BPEEK_W%(i-12)>0 THEN LIST
#1;BPEEK_W%(i-12)
32360 END REPEAT scan_rt
32370 END DEFine HOW_COME

```

The Missing Last Installment Of The File
Browser Article From The Last QL World

It's the 'lost' final part of the QL World browser program, with file copy, move and delete operations implemented as promised in the last issue of the magazine, printed in April 1994. The accompanying article was either never written or only in draft - it's not on the disc, though there was a paragraph about toolkit dependencies which are noted anyway in the listing.

Simon Goodwin asked if I could host this online for people who followed the original article. Simon said:

"I'm copying this to Dilwyn Jones in case he'd like to host the file online for others... after 15 years it's hardly 'news', some readers may be glad of the closure, if nothing else!"